THE IRON AGE

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Making Repair Work a Profitable Adjunct

How and Why the Machine Builder Could Give More Attention to Upkeep of Machines He Has Sold

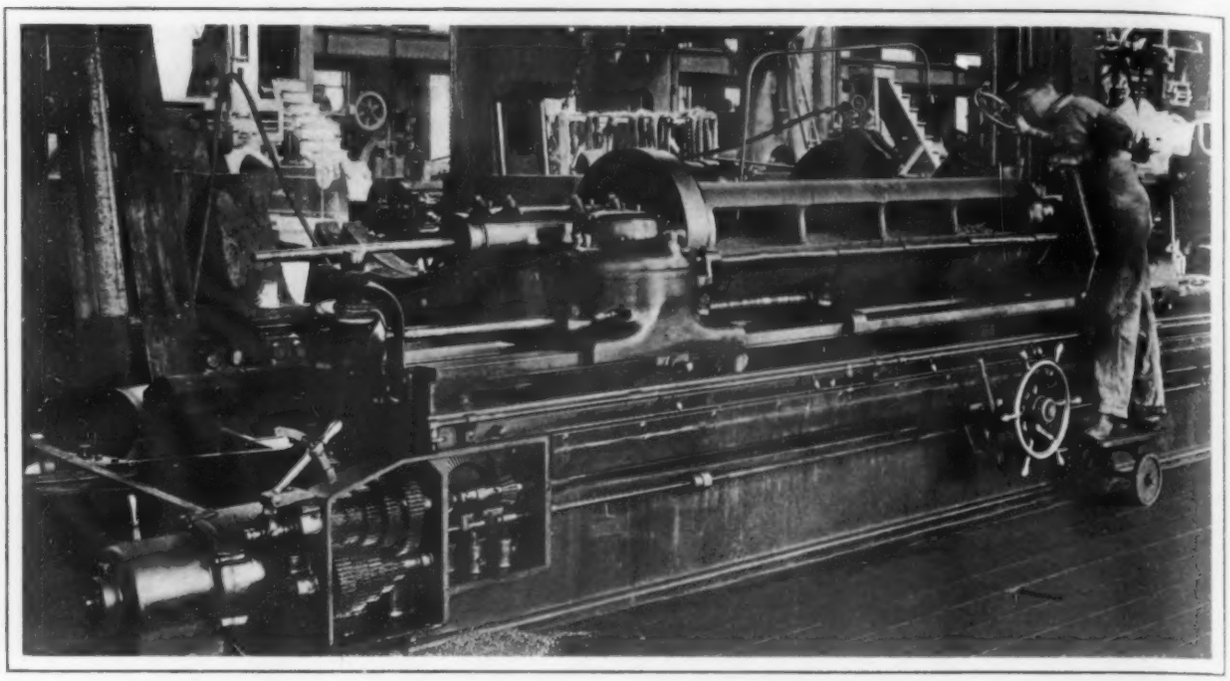
BY C. A. TUPPER

Seasons such as the present, when production is slack in many lines, are very generally taken advantage of for making repairs to machinery; and parts needed for replacement are usually ordered from the manufacturers. These should, as a rule, be readily obtainable; but in many cases they are not, and when there is delay in filling orders it leaves a feeling of irritation which may, later on, lead to the loss of more important business.

This is a phase of manufacturing which, during the hurry and rush of modern industry—at least in the United States—has been more neglected by machinery builders than probably any other that can be named. Reference is not made here to repairs resulting from breakages, which have to be made good in accordance with guarantees, but of replacements rendered necessary by the wear and tear of continuous or intermittent operation, such as can only be expected in the ordinary course. It will be conceded that the basis of all permanent business is the satisfied customer; and one of the most important factors in keeping the customer in that frame of mind is proper attention to the matter of repairs. Repair part orders ought not, of course, to be allowed to hold back or otherwise hamper the production of the machines which are, at the same time, going through the shops. That usually constitutes the most serious objection to such orders and accounts for much of the evasion and neglect with which they are treated.

One of the most satisfactory solutions of the problems involved is separate provision for repair work and the devotion to it, primarily, of certain specified facilities; or, in other words, creating a

Spares and Repairs Department of Pump Works at Frankenthal, Germany



Special Machine for Repairs on Engines, Compressors, etc., Shown Here with Attachment for Regrinding Valves

distinct department for this purpose and putting it on a proper earning basis, the same as any other part of the establishment. There are, however, many different methods of working out the details. In one large Western plant, comprising a foundry, forge shop and machine shops, where jobbing or custom work forms a part of the business in addition to regular lines of manufacturing, the repair orders have been combined with the custom work and are treated on precisely the same basis. For the most part the system employed might be adapted to a separate repair department, and they are given here for their suggestive value.

SYSTEM IN HANDLING REPAIR BUSINESS

As the orders come in from customers, they are written out at the office in quadruplicate, that is, three carbon copies. Two copies go to the shipping department, one being kept on file there and the other returned to the office when the part called for has been completed or shipped. The third copy is sent to the shop superintendent and the fourth is kept in an alphabetical file at the office.

From the order sent to the shop superintendent a requisition is made on the jobbing and repairs department, and the order itself is filed alphabetically under the customer's name. A clerk in the repairs section of the department mentioned, who has his desk in the superintendent's office, then checks the requisition against the stock list, to ascertain whether the part is one regularly carried. If so, the requisition, after entry of the essential details on a card record, is sent directly to the stock clerk, and forwarded with the part to the shipping platform. From the man in charge there it goes back to the repairs clerk with a notation that the part has been forwarded to the customer by freight or express, as the case may be, with route and date also stated. These facts are entered on the card record and the requisition is returned to the stock clerk to be filed. In the latter's office there is a cross-reference between this requisition and the record of the particular stock from which it was withdrawn; so that it can be subsequently looked up, if necessary, from either side.

Meanwhile, the second copy of the original order above referred to has been sent from the shipping rooms to the billing clerk, with the particulars of shipment, including prepayment of handling and transportation charges, if such prepayment is made, and a statement of the total charge sent to the customer. Notice of shipment, with railroad receipt, bill of lading or other necessary papers, is also mailed to the customer on the same day that the part is forwarded. In writing out shipping directions, no abbreviations are allowed to be used, even the name of the state being written in full since the company had trouble over a shipment billed to "Ia" which turned up in "La" and was only located after long search.

If the part is not carried in stock, but must be cast and machined, a requisition from the repairs clerk is sent to the office of the pattern shop and foundry. When a new pattern has to be made, an order for it is entered accordingly; but, if not, the requisition is sent directly to the pattern storage foreman, the pattern taken from its rack, and this pattern sent with a molder's ticket to the foundry; the requisition being returned, with a copy of the molder's ticket, to the pattern shop and foundry office. There the requisition is filed alphabetically and the copy of the molder's ticket numerically, with cross references. For a forging the course pursued is similar, involving entry of the requisition at the office of the forge shop foreman, selection of the necessary billet or bar and having it worked up as ordered.

Rush work is indicated by a pink ticket; and, as the use of this color is rigidly restricted to cases where there is real need of dispatch in delivery, it always has immediate attention.

All work done on repair jobs is checked up at night, and a record kept by the clerk in the superintendent's office which shows at any given time, by the cross references, how far any order has progressed towards completion. When a casting or forging is delivered to the machining department, it is kept track of in a similar manner, and the course of the finished part, with entry of records, etc., is precisely the same as above described for one taken from stock, except that production costs also go to the billing office.

For the pattern shop, foundry and forge shop a separate set of records is kept for repair work, under the supervision of a clerk especially assigned to that service, but none of the equipment is segre-

gated for it. Ordinarily, in fact, the parts go through on regular orders, which are made large enough to include both current manufacturing needs and stock from which spares can be drawn. The same is also true, in general, of the machine shops; but there certain tools of each group are assigned to repairs; and, if needed in repair work, they cannot be used for any other. When not so used, they are at the disposal of the other departments on the basis of a suitable credit to the jobbing and repairs department. This, however, is only approximated, in order to avoid unnecessary clerical work, and is a matter of agreement between the repairs clerk and the foremen.

If more facilities are needed than these tools afford, the jobbing and repairs department "buys" service from other departments, and if need be can get help outside. The equipment placed at its disposal, however, is sufficiently comprehensive to provide for all ordinary contingencies. Naturally, when work is slack all around, some of the repair tools stand idle, as the manufacturing departments give preference to their own machines; but, as a rule, the balance is well maintained. Normally, as stated above, a season of dullness in the regular lines of production is usually accompanied by a rush of orders for repair parts, and vice versa. If any department, however, can afford standby losses, it is the one entrusted with repairs, as will be brought out farther along.

MAKING SEPARATE DEPARTMENT OF REPAIRS

It is desirable for any machinery manufacturer to handle the repair work as a separate department and have some one of sufficient ability made responsible for its success. This can not only be made a means of maintaining satisfactory relations with customers, but also of earning an excellent profit on the permanent investment and working capital which it involves. Compared with the sales margin on new machinery, spare parts and repairs almost always bring good prices; and, as most of the orders for them come in without solicitation, the usual selling expense is eliminated, which still further increases the relative net returns. The principal danger here, in fact, is to avoid the temptation of charging too much to customers, particularly where advantage can be taken of their pressing necessities, and thereby alienating them from further patronage when purchasing new equipment.

While, however, repair orders will come in unsolicited, no manufacturer of machinery should wait for them to be forced upon him. He should at least make customers understand, through direct mention by salesmen and in correspondence, that this work is wanted; that he wants to make all repairs on machines of his build and that they will be given just as careful attention as orders for new equipment.

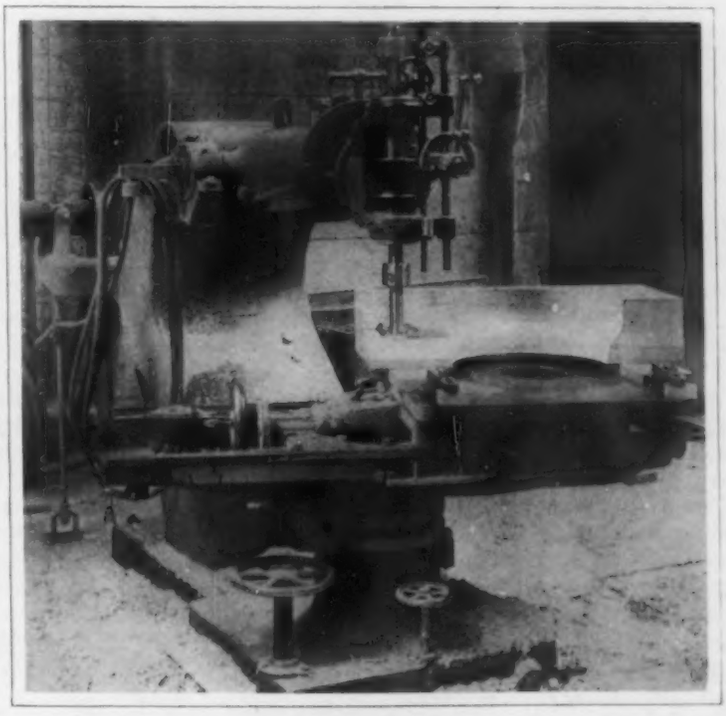
The importance of this can be demonstrated by reference to three machinery building companies that, within the writer's personal knowledge, have been heavy losers as a result of indifference to this policy. The apparatus manufactured by each is of standard design, approximated very closely by competitors, and the latter are in a position to fill orders for repairs without much difficulty. One of these concerns has out upward of 31,000 machines which are subjected to peculiarly severe service and, under the most favorable conditions, require frequent replacements of wearing parts. Some years ago its nearest competitor, whose apparatus is practically interchangeable with the other in these wearing parts, made this feature even more pronounced by changes in design and started out to get the first-named company's repair orders. This it had no trouble in doing, as users were tired of the inattention given to that phase of the business, and soon the competitor had practically the control of the repair work, which it clinched by making very favorable terms for season contracts.

It did not stop there, however. Gradually, as new machines were needed, the competitor, being in constant touch with users, got its own taken on trial, and, using the repairs brought to it as illustrations of the weak points of the original make, it displaced the latter more and more. Many times the company which had been first in the field and had practically developed it did not learn of these opportunities for new sales until long after the competitor had made deliveries. Today, the relative positions of the companies are reversed. The other two cases referred to above are similar but have not been carried to the same extreme.

ASCERTAINING PERFORMANCE IN SERVICE

One of the advantages enjoyed by the concerns that have made a specialty of repairing the machines of competitors, as well as their own, is the experience obtained from the continual handling of the various parts and the knowledge thus forced upon them of the effects of actual service conditions over a wide field of operation. It enabled them to make such a study of the essential factors of design as to put them in the lead of other manufacturers of the same types of machinery. This same condition, however, applies with practically equal force to work done by a manufacturer which involves repairs to machines of his own build exclusively. There is no better means of becoming acquainted with points of weakness in their mechanical structure and with desirable alterations either in design or in the selection of material.

Furthermore, if this department of



Universal Woodworking Tool of English Design Used in Repair Part Work for a Great Variety of Operations on Patterns

the business is properly conducted and provision made for regularly carrying a stock of spares for immediate shipment on repair orders, it will enable average production costs to be cut down, by the ability to put parts through the foundry and forge or machine shops in greater quantities and to purchase materials to better advantage.

There are other phases of the subject, perhaps equally important, which there will not be space to consider here; but the principal lesson to be learned is the necessity, for any long continued business, of handling repairs on a definite system, with the same thoroughness and attention to detail that characterizes the work of the plant as a whole.

RED IRON ORES OF TENNESSEE

Rockwood and Sweetwater Districts Have Been the Chief Sources of Supply.

Since it has proved possible successfully to make basic open-hearth steel from Southern iron ore, the attention of the iron makers of the United States has been turning toward the Southern iron ore fields to a considerable extent during the last decade. This statement introduces Bulletin 16 on "The Red Iron Ores of East Tennessee," by Ernest F. Burchard, recently issued by the United States Geological Survey. The bulletin is intended to describe the red iron ores of the northern part of what in a broad way has been termed the Chattanooga district. In prospecting the ore beds every section has been inspected and measured.

There are three formations which carry red iron ore in noteworthy quantities in East Tennessee. The lowest or oldest is the Tellico sandstone of Ordovician age; the next and most important is the Rockwood formation of Silurian age; and the last, but of slight importance, is the Grainger shale. The term ore in the report is meant to cover any ferruginous material which may have a value at present or in the near future as a source of iron. The type of iron ore considered is restricted to that commonly known as red ore which is composed essentially of red hematite, Fe_2O_3.

THE SWEETWATER DISTRICT

The most important district of the Tellico sandstone formation is known as the Sweetwater locality. This deposit of ore lies one-half to three and one-half miles northeast of Sweetwater, Tenn. The unique feature of this deposit is that the dark, bluish red and steel colored clay and some of the reddish surface clay really constitute an earthy iron ore. This locality was first visited in 1906 when mining was in progress and about 150 carloads of iron ore had been shipped to blast furnaces in Chattanooga. The most notable characteristic of the deposit is the large proportion of hematite present. Nearly 8000 tons is reported shipped to blast furnaces in 1912. Average analyses are said to have shown a little more than 40 per cent. metallic iron and between 2 and 3 per cent. manganese. It is stated that a sintering plant is to be built by the American Ore Reclamation Company comprising four Dwight-Lloyd machines. This plant is planned for an output of 400 tons of sintered ore daily, producing a cellular sinter. In the Tuckahoe district of the Tellico sandstone formation the iron ores, though abundant in the weathered zones, are irregular and in shallow veins and not easily accessible. They are therefore put in the class of deposits of possible future value.

THE ROCKWOOD DEPOSIT

The most important ore deposit of East Tennessee is known as the Rockwood iron ore, named from its occurrence at Rockwood, Tenn. It is principally the red oxide and is amorphous, red to bluish black, lustrous and mixed with calcium carbonate and other minerals. It outcrops along the foot of the Cumberland escarpment from the southern border of the State below Chattanooga to the northern border of the State at Cumberland Gap and in several separate areas in the Tennessee Valley. On the east side of the Sequatchie Valley, about 9 miles above the confluence of Sequatchie and Tennessee rivers, the outcrop of this ore has been found to carry ore that is workable. This locality is known as the Inman mines. More than 2,000,000 gross tons is reported to have been shipped from here to the now abandoned blast furnaces of the Tennessee Coal, Iron & Railroad Company at South Pittsburgh, Tenn. According to data regarding the ore beds of central East Tennessee this section carries in various parts some very important areas of red iron ore. It is the most productive part of the State. The ore is of a comparatively high grade, the hard variety carrying 35 to 42 per cent. of iron with 0.50 to 0.60 per cent. of phosphorus and from a trace to 1 per cent. of sulphur. At LaFollette, Tenn., the Rockwood ore occurs in one important bed in which there are 3 ft. 10 in. to 5 ft. of ore, separated by several shale partings. If only the area bounded by Pine Mountain and Cumberland Mountain and extending 15 miles northeast from Fork Mountain be considered, the LaFollette mines would be located about the middle of the southeast edge of this area. A solid block of ore, having an average length of 79,200 ft., an average width of 47,520 ft. and an average thickness of 4 ft., would thus be indicated, making a total of 15,054,336,000 cu. ft. of ore. Allowing 12 cu. ft. to the ton, the enormous quantity of 1,254,528,000 tons of hard ore would probably represent a reasonable estimate of the reserves in this one area.

The red iron ores of East Tennessee have been mined and utilized for the manufacture of iron for more than half a century. As early as 1854 there were five small blast furnaces working almost exclusively on Rockwood hematite. These furnaces were all located close to the outcrop of the ore. In addition to these furnaces, in two of which the blast was created by steam power, the rest by water power, there were at that time 15 bloomaries or forges using Rockwood ore for making bar iron.

The question of markets in this area is not at present serious, since most of the blast furnaces of the district, when in blast, are willing to buy ore at market prices. Six furnace companies with a total of nine coke stacks in East Tennessee have been built to use the red hematite ores of the State. Statistics for 1911 show the production in Tennessee of 251,083 gross tons of red iron ore, 218,645 tons of brown ore, 198,050 tons of limestone for flux, 6,433,156 net tons of bituminous coal, 330,418 net tons of coke, and 297,594 gross tons of pig iron, the greatest previous production being 400,269 long tons in 1910.

At the regular meeting of the Cleveland Engineering Society, January 13, an illustrated paper on "Electrical Heated Devices and Their Industrial Uses" was presented by Lawrence W. Cady, consulting engineer, Cleveland. Wood preserving and the uses of treated lumber are to be discussed in an illustrated address before the society, January 20, by F. A. Weaver, Ayer & Lord Tie Company, Cleveland, and natural gas January 27, by J. C. Gillette, master mechanic, National Carbon Company, Cleveland.

A Roller Bearing Pneumatic Drill

The use of roller bearings for the connecting rods combined with crankshafts running on ball bearings is the special feature characterizing the improved Little David pneumatic drill that has recently been brought out by the Ingersoll-Rand Company, 11 Broadway, New York. Other features of the older type, such as accessibility of parts, the casting of the cylinder head integral with the drill casing and a small number of parts, have all been retained.

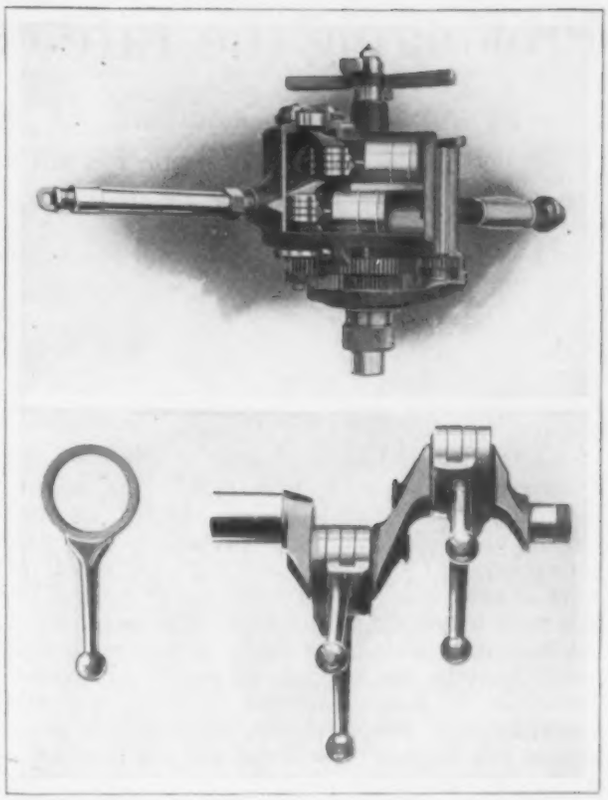
The cylinder shell is a high grade steel casting, which insures lightness, while the metal is distributed to give strength where that is needed. It is possible to assemble or disassemble the entire motor apparatus through the crank case by simply removing the cover.

The motor or engine is of the angular four-cylinder, single-acting reciprocating piston type, each pair of pistons being attached to opposite throws of a double crankshaft. This arrangement is relied upon to give a balanced crank action and insure continuous smooth running. The four connecting rods, one of which is shown in the lower left corner of the accompanying engraving, are exactly alike and can be interchanged. These are formed by drop forgings from a single piece of steel. They run on Hyatt roller bearings, the ends of which may be seen in the lower right corner of the engraving. This arrangement, it is pointed out, reduces friction and gives an easier running tool. With a view to securing ease of assembly the connecting rods are fastened to the piston by a spring arrangement. As will be noticed, the piston ends of the rods are ball shaped and flat steel springs are slipped over them. These balls have their bearings in the center of the pistons, forming ball and socket joints, an arrangement which permits the connecting rods to yield to pressure from any direction without, it is pointed out, causing the piston to bind in the cylinder. Another advantage of this construction is that the piston can turn in the cylinders and distribute the wear evenly.

In attaching the piston rod, it is simply necessary to see that the four pistons are in place, after which the crank is put in with the connecting rod and springs all assembled, one spring being inserted at a time. The piston is then pushed to the bottom of the cylinder, and the crank is rotated until the ball on the connecting rod reaches a seat in the piston. The spring is then pushed down until it seats in slots near the bottom of the piston. For removing the crankshaft and connecting rods, long pliers are inserted in the two holes in the spring near the slit, the spring being compressed and pulled out of the piston. After all of the springs have been disconnected the entire crank with the connecting rod attached is readily lifted from the case.

The crankshaft works in separator type ball bearings and it is emphasized that this type of bearing is more satisfactory for machines operating at medium and high speeds than the full type, as in the latter, it is pointed out, the balls come in contact and wear flat rings on their circumference in a short time, with resultant loose bearings and unsatisfactory operation. It is emphasized that this rapid wear is due in a large measure to the fact that the balls are rotating in opposite directions at their points of contact, which doubles the wearing effect.

The drill spindle has a ball thrust bearing between the shell and the feed spindle, which is relied upon to relieve the main frame of all thrust or strain. It is machined to receive standard Morse taper shanks and if desired can be threaded on the end for the use of chucks or other special attachments.



A View of the Drill Partly in Section Showing the Construction and One of the Crankshafts, Connecting Rods and Ball Bearings

Each valve controls two pistons which act on alternate strokes. As the valves are completely balanced and have a rotating motion instead of a reciprocating one, it is emphasized that wear is equalized. They are geared to the crankshaft through the spindle gear, it being pointed out that there are no rocker arms or eccentric straps to complicate construction and increase the opportunity for wear and breakage. These gears are of steel drop forgings with cut teeth and are inclosed in individual chambers, thus avoiding any necessity for disturbing the other parts of the machine, should access be desired. The valves are of hardened steel, finished by grinding, and operate in bronze bushed chests. In setting the valves, it is simply necessary to see that the letters stamped on the valve and crankshaft pinions register with the letters on the main gear. All the parts subject to wear and strain are made of special steel, which has been hardened and then ground, to give a close working fit.

The tools can be made reversible or non-reversible at the will of the operator by changing the position of a sliding sleeve on the throttle handle. Five sizes in all of drill are made. The first is designed for heavy drilling, reaming, tapping and flue rolling, while the second is intended for similar work of a lighter character. Light drilling and reaming is the field for which the third size is intended, while the two remaining ones are fitted with chucks for wood boring augers for 4 and 2 in. holes respectively. These two latter types are lighter than the others and are not fitted with compound gearing for multiplying the power.

The crankshaft and gears revolve in grease packed dustproof chambers. Lubricant is fed into all the working parts by the revolution of the crankshaft.

Prolonging the Life of the Bessemer Process

Additions of Manganese Sesquifluoride Permit of the Use of Lower Grade Pig Iron in the Converter

BY L. GOLDMERSTEIN

So much has been unsuccessfully done to restore the Bessemer process to its former position of supremacy in the production of steel that it was with but little hope of success that I started my investigations four years ago. Only time can show definitely in how far I have succeeded.

As far as the decarburization of iron goes, the Bessemer process leaves very little to be desired, and it could have held its own against all later comers, such as the open-hearth and electric furnace processes, if there were a sufficient supply of suitable ores, i. e., ores without either sulphur or, still more important, phosphorus. The weakness of the Bessemer process lies really in its inability to treat properly the two above named impurities. Therefore, if a process could be found for economically and completely eliminating the phosphorus and sulphur present in the pig iron while it is treated in the Bessemer converter, there would be a chance for the otherwise ideal process of steel manufacture to come back to the position which it held some fifteen years ago.

FLUORINE AS AN ELIMINATOR

In my investigations I found that fluorine has a powerful affinity for phosphorus and sulphur, and that there are several fluorine compounds which decompose at the temperature prevailing in the metal bath of the heavy metals, say iron or copper. When these compounds decompose, fluorine, which is one of the most energetic elements known to chemistry, violently combines with those elements for which it has a particular affinity—phosphorus, sulphur, and hydrogen—and forms with them gaseous compounds which instantly escape from the metal and cannot, therefore, contaminate it on cooling.

Not every fluoride, however, can be used in this process. It appeared to me theoretically evident that no natural fluoride, such as calcium fluoride or cryolite, could be used, because, with such a powerful and energetic substance as fluorine, only the most stable compounds could occur in nature, and such compounds would be very unlikely to decompose at the comparatively low temperature prevailing in the bath of molten steel. Experiments, both my own and those of others, have confirmed this view. Further experiments have shown that fluorine has particular affinity for those elements of which the atomic weight is near its own, and forms with them very stable compounds; this practically eliminated the use, as far as the purification of steel was concerned, of such compounds as aluminum or magnesium fluoride, which do not decompose in molten steel, and are either incorporated, unchanged, in the metal, or pass, equally unchanged, into slag. It very soon became clear that only fluorides of heavy elements could be used to advantage, and even of those only certain particular classes. Most heavy elements (having an atomic weight in excess of 41) form with fluorine two compounds—fluorides and sesquifluorides—and, while the fluorides are as a rule fairly stable, the sesquifluorides, probably on account of there being a molecule of fluorine too much, decompose far more easily, and what is most important, decompose directly into fluorine and the metallic element, just as is required for the metallurgical process under consideration.

None of the sesquifluorides could be obtained on the market or from dealers in laboratory chemicals, and I had to make myself all that I used in my early experiments or to order them made for me (usually the latter could not be done). It was only considerably later that I succeeded in persuading an important German concern to start experiments in producing some particular sesquifluorides commercially (I shall say more about these experiments later on). But not even all the artificial fluorides and sesquifluorides could be used successfully. Further tests have shown that many hydrates of fluorides were vaporized without decomposing, and escaped from the metal without affecting its chemical composition; so that finally the class of fluoride compounds that could be successfully applied to the purification of steel narrowed down to artificial fluorine compounds of metals having an atomic weight in excess of 41, having a constitution approaching, preferably, the type of sesquifluorides, and being, sometimes preferably and sometimes necessarily, anhydrous.

ADDING FLUORIDE COMPOUNDS TO THE BATH

As to the introduction of the fluoride compounds into the metal bath, several ways were experimented with. In my tests made in a steel foundry in Pennsylvania, I tried placing the fluoride, not heated, in the form of powder, at the bottom of a ladle, and pouring the metal over it. The amount of heat required to decompose the fluorine compound proved to be so large as to cool very rapidly the metal, and there was not sufficient time for the chemical process to take place. The results were therefore not uniform; and while sometimes complete purification took place, none could be found in other cases. From further experiments were evolved the following fundamental principles for the use of fluorine compounds for steel purification:

Where these compounds are used with an outside supply of heat, as in crucible steel production or the open-hearth furnace (I shall say below why it is also of advantage to use them in those processes), the fluoride may be introduced as soon as the metal has fully melted, the bath being strongly stirred immediately after the introduction of the fluoride. It is of advantage to introduce the fluoride in several batches, in order to avoid cooling of the bath and loss of the salt. When the fluoride is used in a process carried on without a supply of heat from the outside, as in the Bessemer process, it is of advantage to introduce the fluoride salt after the silicon present in the metal has burned out (for fluorine has a powerful affinity for silicon, and will unite with it if present, which would entail an unnecessary loss of fluorine), having previously raised the salt to as high a temperature as convenient. It may be introduced, e. g., with the blast.

THE CHANGE PRODUCED IN THE METAL

What happens then is this: The salt decomposes and liberates free fluorine which combines with the impurities in the iron for which it has a greater

affinity than for the iron itself. The various fluorides of sulphur, phosphorus, arsenic and hydrogen are all gases at the temperature prevailing in the metal bath, and therefore escape immediately, leaving in the bath a metal of the highest purity.

There is, however, more to this process than the mere purification of the metal. The metal with which the fluorine is combined in the salt (nickel, manganese, copper, etc.), after the fluorine breaks away, remains in an extremely finely divided state of separate molecules, and in what is known in chemistry as the nascent condition. A peculiar characteristic of this state of matter is its tendency to combine with other elements present at the instant of the liberation of the element. Owing to this property of the elements which were previously combined with the fluorine, they enter with peculiar avidity into alloys with the main element of the bath, say steel, to form alloy steel possessing some special properties. As the fluorine itself eliminates the impurities, by this process high grade alloy steels may be made from cheap kinds of pig iron or steel direct.

COST OF THE FLUORIDE PROCESS

In order, however, that a process of making steel should be of interest nowadays, it must be not only better than other processes, but also cheaper, the cost element being of especial importance in view of the fact that, at a certain price, steel of any desired purity may be now produced by the open-hearth or electric furnace method, or one of the combinations of these processes with the Bessemer process. The following calculation will give an idea as to the cost of the fluoride process.

Let us assume that we start with pig iron containing 0.25 per cent. of phosphorus, and that it is desired to produce steel containing not more than 0.05 per cent. of phosphorus. Per ton, therefore, 4 lb. of phosphorus must be eliminated, which requires approximately 5 to 6 lb. of fluorine. We take for the purposes of this calculation the latter figure, and propose to use the fluorine in the form of manganese sesquifluoride, Mn_2F_6. To obtain 6 lb. of free fluorine, 12 lb. of manganese sesquifluoride will have to be used. While this salt was discovered by Moissan some 15 years ago, it has never been used for anything practical, and never manufactured by a commercial concern until I started my experiments. It cannot be said therefore to have a definite price; but at my request the great chemical works of De-Haen in Seelze near Hannover, Germany, have made a series of experiments and are prepared to deliver the salt at 95 marks per 100 kg. This, with duty, would come to about 13 cents per lb. in New York. There can be scarcely any doubt that in large quantities anhydrous manganese sesquifluoride may be produced even more cheaply than this. But for the purposes of this calculation we will assume the above quoted figure. Twelve pounds at 13 cents per lb. gives $1.66; in return for this sum 6 lb. of manganese is also introduced into the metal, and a low phosphorus steel is obtained in the Bessemer converter from a comparatively cheap pig iron.

SPECIAL FIELD IN RAIL AND BRIDGE STEEL

The fluoride process will apparently have a field of application of its own, and that is in the production of rail and bridge material. The steadily increasing weight and speed of railroad trains requires stronger and better materials for the rail. In the first place, however, what is required is a material of perfect uniformity, which, with perhaps a comparatively low maximum strength, would have a high minimum strength, since it is the low minimum strength of some rails that causes wrecks. If the present day steel rail could be made equally strong throughout, it would be probably fully sufficient for many years to come, and the railroads could quite well do, at least for all general purposes, without either expensive alloy rails or probably equally expensive heat treated rails. But to make the rail of uniform strength throughout, or of high minimum strength, it must be made of material absolutely free of impurities. It is the presence of impurities, either solid or gaseous, that causes mainly blowholes, segregation, intensive crystallization through fatigue, etc. It is quite possible that the electric furnace will give us, at a price, a perfectly pure steel, and it is certain that the fluoride process can do it also, at a price. The writer is not fully prepared to discuss here under which conditions either of these two processes is more applicable, as his experiments have not been carried far enough for that. It appeared to him, however, that the engineering world was entitled to the information contained in the above.

A New Style of Non-Skimming Crucible

For use in connection with the melting of metals, and more especially those of the precious group, the Joseph Dixon Crucible Company, Jersey City, N. J., has brought out a new crucible. It represents an effort to do away with skimming and also prevent charcoal or molten fluxes from getting into the ingot or casting. As indicated in the accompanying cut, the crucible has a bridge at the top with a hole in it for the clean metal. Other points upon which special emphasis is laid are that the holding capacity of the crucible is not reduced in any way by the new design, and that it is possible to stir the metal the same as in a regular crucible.

A New Type of Crucible Which Has Been Evolved with a View to Doing Away with Skimming

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The Browning Engineering Company, Cleveland, Ohio, which has changed its name to the Browning Company, has increased its capital stock from $850,000 to $1,000,000. It has just booked an order for a locomotive crane for shipment to Sweden. Foreign-built cranes are said to be heavier and slower in moving than American cranes, and the superiority of the latter resulted in this order being placed with an American builder. The Browning Company has also recently received an order from the Erie Railroad for a large railroad ditcher.

Hermann Boker & Co., New York City, have opened a branch office and store room at 703 Frankfort avenue, Cleveland, Ohio, where a line of tool steels, nickel bars, sheets and rods, music wire, steel balls and other products will be kept in stock. The Cleveland office will be in charge of Wilmot H. Kissam, who was formerly connected with the New York office of the firm. His territory will include Ohio and parts of West Virginia and Kentucky.

Swedish Iron and Steel Developments in 1913

Progress in Iron Ore Concentration and Briquetting—The Manufacture of Iron Sponge—Electric Smelting and Its Future

BY IVAR BARTHEN*

It has been claimed for years that Sweden is particularly well situated as far as the iron and steel industry is concerned. This may be true in one sense: Sweden has the great advantage of vast resources of high class iron ores—inexhaustible, from the standpoint of the demands of the home country only. But over against this advantage is the fact that Sweden is sadly lacking in coal suitable for iron ore melting.

However, the result of this state of things has been that Sweden has been forced to look for charcoal as the predominating fuel of the blast furnaces. I am not sure that Sweden would have succeeded in progressing in the same degree up to the present time and maintained the reputation of producing iron of the highest quality obtainable, if suitable coal were to be had at reasonable cost. Thus, the country had to maintain the use of charcoal in the blast furnaces. The purity of this fuel, in connection with the purest iron ores ever obtainable, has brought it about, that the Swedish iron has kept its position at the top, being preferred all over the world, where particularly high quality of the finished product is required. Fortunately the vast forests of the country easily delivered all the charcoal wanted. But as time passed, the demand for raw material for the sulphite, sulphate and pulp industries grew, and these manufacturers proved able very soon to utilize smaller and smaller sections of wood and to buy these, formerly piled up almost entirely for charring-stacks, at a higher price than the charcoal industry could. The price of charcoal therefore grew and grew. This has brought the Swedish iron and steel works into a somewhat awkward position.

Still, the country's iron and steel works have enjoyed a rather good season during the past year. But there has been no rush. The works have all been very busy and most of the production of the year to come is already disposed of. Still prices have shown no sign of increasing, rather the converse, especially in the case of Lancashire iron.

SOME RECORDS MADE IN PRODUCTION

Some of the records for production, those of pig iron and open-hearth steel, are the highest ever published. During 1913 there have been operated 113 blast furnaces, 210 wrought iron hearths, 17 Bessemer converters and 57 open-hearth furnaces. The following table shows the production in gross tons of the last four years, the records of 1913 being averaged in proportion to those for the first three quarters of the year:

	1913	1912	1911	1910	Increase for 1913 over 1912
1. Pig iron ...	745,000	699,800	634,400	603,900	6.5 per cent.
2. Open-hearth ingots	450,500	404,100	372,700	372,500	11.5 per cent.
3. Bessemer ingots	111,000	107,200	93,900	97,600	3.5 per cent.
4. Wrought iron blooms and rough bars	155,000	148,800	146,700	151,700	4.2 per cent.

Items 1 and 2 constitute record productions; item 3 is surpassed by one year only, 1896. For tem 4, 1892 leads with 235,400 tons; thereafter the production has slowly decreased, year by year. It is to be presumed that the increase in wrought iron last year is only occasional.

The following tables give the export figures in gross tons during the last three years, 1909 being exceptional because of the general strike.

	1912	1911	1910
Pig iron	204,800	150,500	134,100
Iron and steel.....	480,400	418,300	421,300
Iron ores	5,420,600	5,086,900	4,434,800

Export during January to October

	1913	1912
Pig iron	176,100	151,200
Total export	418,300	382,900
Iron ores	5,662,700	4,902,700

Attention should be called to the considerable increase from January to October, 1913, as compared with the same period of 1912. The ratio between acid and basic Bessemer production in 1912 was about 4 to 5 while that between acid and basic open-hearth was about 3 to 5. The production of pig iron per blast furnace in 1912 was 5881 tons.

The total production of iron ore in 1911 was 6,150,700 tons of which 5,508,800 tons were first quality ore while in 1912 the total production was 6,699,200 tons of which 5,945,400 tons were first quality. Of the total production of first quality iron ore in 1912, 2.9 per cent consisted of ore with an iron content of 40 to 50 per cent; 21 per cent with an iron content of 50 to 60 per cent, and 76.1 per cent with an iron content of 60 to 70 per cent. Ore containing over 0.10 per cent phosphorus constituted 81.8 per cent of the total production while ores with a sulphur content of 0.010 to 0.020 per cent made up 57.4 per cent of the total ore produced.

The total iron ore production in 1911 was 6,150,700 tons, of which first quality ore was 5,508,800 tons, and in 1912 it was 6,699,200 tons, of which first quality ore was 5,945,400 tons.

CONCENTRATION AND BRIQUETTING

Of the total first quality ore produced the following quantities were obtained through magnetic separation, sometimes directly from the rock as it comes from the mine, sometimes after being reduced to small pieces: in 1911, 385,000 tons, and in 1912, 605,400 tons.

The magnetic separation plants are, as a rule, situated quite close to the mines; 23 such works were operated during 1912 against 21 in 1911.

Of the rough ore produced there was handled, in concentrating works in 1911, 860,200 tons, giving 374,200 tons of first quality pulverized concentrated ore, "slig" so called. In 1912 from 1,215,300 tons of rough ore there was produced 520,700 tons first quality "slig." During 1912, 34 concentrating works were operated against 31 during 1911.

Seventeen briquetting works in 1912 produced 288,600 tons of briquets, the raw material being the pulverized concentrated ore or "slig." The briquets are formed like ordinary small bricks and are used in the blast furnace just as ordinary lump ores. The method of carrying out the briquetting process is outlined below: A definite weight of the "slig" is stamped together in an iron mould into small bricks. These bricks are placed on a car,

*Assistant chief engineer, Jernkontoret, Stockholm, Sweden.

which is moved forward automatically in a furnace about 65 ft. long. This furnace is heated in the middle by an oxidizing fire. Thus the bricks move along slowly from one end to the other, through a middle zone of maximum heat. By this process the "slig" is given a form more suitable for handling. Further most of the sulphur is burnt away and the FeO becomes Fe_2O_3, rendering it more easily reducible in the blast furnace. The iron ore concentrating process has proved remarkably useful to most of the Swedish iron ore mines, many of them having mountains of poor ore piled up during hundreds of years past.

IRON SPONGE AND ELECTRIC PIG IRON

Two remarkable inventions for extracting the iron from the iron ore have been heard of from Sweden lately; both claimed to overcome the difficulties arising from the lack of suitable coal. Unfortunately both of them have not measured up to the expectations at first attached to them. I refer to the iron sponge process and the electric blast furnaces. Experiments to reduce the iron directly from the ore have been conducted for several years by the Höganäs-Billesholms Aktiebolag at Höganäs, Sweden. These have met with success to such an extent that an average of 4000 tons of iron sponge per year is produced at Höganäs, but the use of the method is confined to that company, since it is the owner of the only coal mines to be found in Sweden. These coal mines produce three grades of coal, none suitable to compete with the imported English and German coals. The first and the second grade is used for combustion purposes (the second only to a limited extent), while the third grade has been put aside and considered of no value whatever. This third grade of coal and the best concentrated ore obtainable (71 per cent Fe) form the raw material for the production of iron sponge. The coal and "slig" are packed by turns in layers in brick crucibles. These are heated up in an ordinary brick oven. The product is a sponge with an average specific gravity of 2.4, composed of iron and the residue of the coal and ore. Extensive tests have proved that this sponge can be used and melted in the same manner as pig iron, in Lancashire hearths and open-hearth furnaces. The finished product may be tool steel, springs, drills, etc., and it shows excellent quality. A considerable part of the iron sponge is exported. But, as before mentioned, the economy of the process consists in the fact, that the cost for combustibles is nothing except for transportation and handling.

A greater importance must be accorded to the electric blast furnaces, patented by Aktiebolaget Elektrometall, Ludvika, Sweden. The furnace is merely an ordinary blast furnace based upon on electric arc furnace with coal electrodes, fed by a 3-phase alternating current. The number of electrodes are 4 to 6. The preliminary experiments conducted by Aktiebolaget Elektrometall and the results achieved thereby had attracted much attention from all the leading iron and steel interests. It was decided, in 1909, that research meltings on a large scale be undertaken by Jernkontoret (the Board of the Swedish Iron Masters). The Jernkontoret took on lease land at Trollhättan where a sufficient amount of electric power was secured for some three or four years to come. Thus was erected Jernkontorets Försöksverk at Trollhättan. When the researches had been conducted for a sufficient time (1912) and the research committee declared it ready to give a final report of the method, the Jernkontoret had spent about $125,000 on this work. But at this time the practicability of the method was settled, and the two richest iron and steel companies, the Uddeholms Aktiebolag and the Stora Kopparbergs Bergslags Aktiebolag, had already erected their own electric blast furnace plants. In 1911, 5800 tons of electric pig iron were produced; in 1912, 17,600 tons. The output during 1913 is expected to exceed 25,000 tons.

The first expectations of the inventors may have been that only as much coal should be put in the blast furnace as was needed by the chemical constitution of pig iron, as regards carbon, the heat indispensable to the process being secured by electric current. Even if those expectations could not be realized, still about 65 per cent of the coal ordinarily consumed is saved.

The importance of this result may be clearly seen, because of the constantly increasing price of charcoal. There is also another remarkable result. As the content of phosphorus in the charcoal goes almost entirely into the pig iron, the use of the electric furnace has made it possible to reduce the phosphorus content in the finished product. This new type of pig iron has been exhaustively tested for all uses and found by no means inferior to ordinary pig. But there is an important drawback that must not be overlooked. The price of the electric horse-power per year must not exceed 40 Swedish crowns (about $10.70). This being exceptionally low, to be secured by only a few works, the usefulness of the electric blast furnace is considerably minimized. It may be hoped, though, that the further development and use of the method may bring to light some improvements to enlarge the range of the method to some unknown extent. Preparations are in progress for building still more electric blast furnace plants.

ELECTRIC STEEL FURNACES

It is well known that almost the first electric steel furnace used practically, was a Swedish one—the Kjellin induction furnace. The first Kjellin furnace was built in Gysinge, Sweden, 1900, and is still the only one of this type ever operated in Sweden. All other types of electric steel furnaces did not meet a good fate. This is all the more strange, as the electric current is cheaper in Sweden than in most other countries.

Recently a new electric steel furnace has appeared, and it must be admitted that this new type has suddenly made a good start. I refer to the Rennerfelt furnace. It is an arc furnace fed by a so-called compound 2-phase alternating current through 3 electrodes, the one being connected to the junction point of the phases, the two others to the end points of the phases. In the rest, it is said by the inventor, that the furnace may be fed with either of 1-, 2- or 3-phase alternating current, and probably with direct current too. The arc takes a peculiar and, even to the inventor, a somewhat unexpected direction; the arc is bowed down to the bath, thus producing a very high heat. The new furnace is very young but already five plants of this type have been built and a number of others are planned. Among other advantages the furnace has the one of being comparatively cheap, both to buy and to run. It has been constructed thus far for a capacity of 2 tons. The product is steel castings, etc., and the raw material is preferably iron and steel scrap. The invention is watched with considerable interest.

From time to time voices have been heard protesting against the importation of heavy consignments of foreign iron into Sweden, while the country itself has iron ore resources far beyond its own need. Big plants have been repeatedly planned to

meet the domestic demand for poorer qualities such as foundry pig iron, rails, beams, etc. The fuel was to be brought to Sweden by the big steamers, exporting iron ores. These plans have always been given a bright national color, but they met with too little financial sympathy to be realized. Now there seems to be a more favorable turn to affairs. Recently a new and rich company has been formed, the Oxelösunds Järnverksaktiebolag at Oxelösund, Sweden. It has for its purpose first to supply the domestic demand for foundry pig iron but it is understood that other products are to follow. The new buildings have already so far progressed that operations will be begun early in 1915. The output is said to be 40,000 to 50,000 tons of foundry pig iron per year.

CLEANING BLAST-FURNACE GAS

Installation and Operating Costs of Four European Processes

At the fall meeting in New York of the American Institute of Mining Engineers a paper was presented by W. A. Forbes on "The Cleaning of Blast Furnace Gas," a brief report of which appeared in *The Iron Age*, October 23, 1913. In the written discussion of this paper there were communications from four prominent foreign makers of cleaning systems which communications were received too late to be read at the meeting, but have since been published in the Bulletin of the Institute. The salient features of these comments are here presented.

THE HALBERGER-BETH PROCESS

The Dingler Machine Shop Company (Maschinen-Fabrik Aktien-Gesellschaft), Zweibrücken-Falz, Germany, submitted estimates of the cost of installation and operation for plants of different capacities employing the Halberger-Beth dry-cleaning process.

The operating cost, as guaranteed, is 15 to 20 pf. per 1000 cu. m. of gas cleaned. But the latter figure is reached only when the installation is extremely expensive, by reason of unfavorable local conditions. We have assumed 10 per cent. per annum for amortization, and 5 per cent. for interest.

The cost of power has been taken at about 2.5 pf. per hp.-hr., which is rather high for Europe. In Appendix 3, where the horsepower per hour is taken at 4.5 pf., the resultant cost of cleaning 1000 cu. m. of gas becomes 28.8 pf. But this high figure has never been reached in practice. On the contrary, we have been able to reduce the consumption of power per 1000 cu. m. of gas from 105 to about 70 hp. For the supervision, even of the largest plant named, one man is enough, with an assistant, perhaps, for the work of lubrication. The discharge of dust into cars is easily performed by one such assistant.

As to the cost of filter-bags, we have calculated on 6 months as the life of these bags; but they have lasted in practice as long as 18 months—effecting a further reduction of operating costs.

The dust separated by our dry-cleaning plant is used with great advantage to increase the coherence of briquettes, thus giving to works using the Halberger-Beth system a profitable disposition of this otherwise troublesome by-product.

There are other possible ways of utilizing this dust; as an ingredient increasing the strength of cement; as an insulating material, and as a material in the manufacture of glass. These numerous openings for the utilization of the filter dust are a special advantage of this system, avoiding, as it does, the troublesome and costly arrangements required for the disposal of this material under the wet cleaning methods.

The installation costs, as stated in the following appendixes, include the cost of erection, and the cost of our shipment given, in Appendix 1, for a plant in France, includes also the import duty.

Appendix 1.—Calculation of profit for a dry gas cleaning plant, on the Halberger-Beth system. Assumed capacity, about 66,000 cu. m. of blast furnace gas, at 0 deg. C. and 760 mm. barometer.

Cost of Installation

	Francs
(1) One shipment, including reserve	219,000
(2) Large sheet-iron work	50,000
(3) Iron construction of building: about 70 tons at 325 fr.	22,750
(4) Foundations, masonry, and roofing	3,500
(5) Driving-motors and equipment	15,000
(6) Dust-conveyor, etc.	2,500
Total	312,750

Operating Costs

	Francs
(1) Amortization (10 per cent.) and interest (5 per cent.)	46,900
(2) Power, 200 hp for 360 days at 3 centimes per hp. per hr.	65,000
(3) Pay of two attendants at 1,800 fr.	3,600
(4) Repairs, lighting, and oiling	3,000
(5) Bag-removals	4,230
(6) Dust-transportation (average of 10 g. per cu. m. of gas = 0.66 ton per hr., or $0.66 \times 24 \times 360 =$ 5702.4 per yr. at 1.25 fr.)	7,140
(7) Water-consumption, 0.1 liter per cu. m. gas = $6.6 \times 24 \times 360 \times 0.1$	570
(8) Steam-consumption, 10 kg. per 1,000 cu. m. gas.	11,450
Total operating cost per year	141,890

Quantity of gas per year, 570,400,000 cu. m. Hence, cost of cleaning 1000 cu. m. gas, 24.8 centimes. Since the dust can be sold at 7 fr. per ton, or $0.66 \times 24 \times 360 \times 7 = 40{,}000$ fr. per yr., the net operating cost will be 101,890 fr., or 17.8 centimes per 1000 cu. m. gas.

Appendix 2.—Cost calculation per 1000 cu. m. gas on the Halberger-Beth system. Assumed capacity of 48,000 cu. m. gas per hour, at 0 deg. C., and 760 mm. barometer.

Cost of Installation

	Marks
(1) Shipment of the Co., including reserve and mountings	173,500
(2) Iron-construction for building, 55 tons, at 270 M	14,850
(3) Foundations, masonry, roofing, and glass	2,800
(4) Motors and equipment: 2 of 150, 2 of 15, and 2 of 8 hp	15,000
Total	207,750

Operation Costs

	Marks
(1) Amortization (10) and interest (5 per cent.)	31,200
(2) Power, $148 \times 24 \times 360 \times 3 \div 100$	38,400
(3) Pay of two laborers at 1,500 marks	3,000
(4) Maintenance, lighting and oiling	2,600
(5) Bag-renewals	4,620
(6) Dust-transportation	2,480
(7) Water-consumption, 0.1 liter per cu. m. gas, = $4.8 \times 24 \times 360 \times 0.01$	415
Operating cost per year	82,715

Quantity of gas cleaned, $48{,}000 \times 24 \times 360 =$ 414,720,000 cu. m. Cost of cleaning per 1000 cu. m. gas, 19.9 pf. If the dust is sold at 6 marks per ton, there will be a credit of $2480 \times 6 = 14{,}780$ marks, or $1{,}478{,}000 \div 414{,}720 = 3.6$ pf., reducing the cost per 1000 cu. m. gas to 16.3 pf.

Appendix 3.—Cost calculation per 1000 cu. m. of blast-furnace gas, by the Halberger-Beth system. Assumed capacity, 30,000 cu. m. of gas per hour. Plant extensible to capacity of 90,000 cu. m.

Cost of Installation

	Marks
(1) One shipment, including reserve and after-cooler	134,500
(2) Iron-construction for building, 40 tons at 270 M.	10,800
(3) Foundations, masonry, roofing, and glass	3,000
(4) Motors with electrical equipment	14,000
(5) Dust-conveyor and sundries	2,000
Total	164,300

Operating Costs

	Marks
(1) Amortization (10) and interest (5) per cent....	24,645
(2) Power consumption, 105 × 24 × 360 × 4.5 ÷ 100.	40,800
(3) Pay of two attendants, one on each shift, at 1,500 M.	3,000
(4) Maintenance, lighting, and oiling	1,800
(5) Bag-renewals	2,880
(6) Dust-transportation, 6 g. per cu. m. gas = 0.18 kg. × 240 × 360 × 1	1,550
(7) Water-consumption (maximum), 0.1 liter per cu. m. gas = 3 × 24 × 360 × 0.076	198
Operating costs per annum	74,873

Quantity of gas obtained per annum, 30,000 × 24 × 360 = 259,000,000 cu. m. Hence, cost per 1000 cu. m. = 7,487,300 ÷ 239,000 = 28.8 pf. Considering that the dust can be sold at 6 marks per ton, or 0.18 × 24 × 360 × 6 = 9300 marks per yr., this credit reduces the cost to 65,573 marks, or about 25 pf. per 1000 cu. m. of gas.

THE SCHWARZ-BAYER DISINTEGRATOR

Louis Schwarz & Co., Dortmund, Germany, presented some data relative to the cost of installation and operation of the Schwarz-Bayer disintegrator.

The capital expenditure for a gas-cleaning plant capable of treating 5,500,000 cu. ft. of gas per hr. is, in Germany, approximately $36,000. Experience in many plants has proved that the power requirements range from 6 to 9 hp. per 100,000 cu. ft. of gas. The water consumption in treating a gas having a dust content of 2.50 to 3.50 grains per cu. ft. is approximately 122 gal. per 100,000 cu. ft. of gas, when the cooling water has a temperature of 15 deg. C.

The dust contents of gas cleaned for stoves and boilers in such an apparatus will range from 0.04 to 0.1 grain of dust per cu. ft., and in further cleaning such gas for gas engines the dust contents will range from 0.004 to 0.008 grain per cu. ft. The cost of operation is in the neighborhood of 6 to 7c. per 100,000 cu. ft. of gas, and this includes all operating charges.

We feel that our system has many advantages over other existing systems, especially in the way of low power consumption and low water consumption. The Schwarz-Bayer system occupies comparatively little ground space compared to most other systems. The capital expenditure for pumps and piping is very small on account of the small amount of water consumed and on account of only requiring a head of 6 to 8 ft. of water.

THE THEISEN GAS WASHER

Eduard Theisen Company, Munich, Germany, presented some particulars of the operation of a Theisen disintegrator gas washer for cleaning the gas for stoves and boilers at a blast furnace plant in the Luxemburg district:

Number of revolutions per minute, 626.8; capacity of plant, 1,750,000 cu. ft. of gas per hr.; water consumed, 230 gal. per 100,000 cu. ft. of gas; gas suction before entering disintegrator, 2.7 in. of water; gas pressure after leaving the disintegrator, 5.6 in. of water; dust content of gases before entering disintegrator, 0.5 grain per cu. ft.; dust content of gases after leaving disintegrator, 0.01 grain per cu. ft.; power required, 11.5 to 12 hp. per 100,000 cu. ft. of gas.

At the same plant the operating particulars obtained in cleaning gas for gas engines are as follows:

Number of revolutions per minute, 658; water consumed, 415 gal. per 100,000 cu. ft. of gas; pressure of gas before entering disintegrator, 3.5 in. of water; pressure of gas after leaving disintegrator, 6 in. of water; dust content of gas before entering disintegrator, 0.4 grain per cu. ft.; dust content of gas after leaving disintegrator, 0.005 grain per cu. ft.; power required, 16 hp. per 100,000 cu. ft. of gas.

The present Theisen disintegrator is a great improvement over the former Theisen apparatus, particularly in the amount of power required, and this apparatus has been adopted on an extensive scale in European blast furnace plants.

THE FOWLER & MEDLEY GAS CLEANERS

Fowler & Medley Company, Liverpool, England, presented the following particulars taken from the results shown by its vertical gas washing machines installed at the works of the Partington Steel & Iron Company, Ltd., Irlam, Manchester, England, and it has chosen these machines as examples because they are both the latest in design and the largest yet built:

This installation consists of five of our No. 8 cleaners, taking gas from three blast furnaces. At present two furnaces are in blast and three of our cleaners in use and the results of the tests made by the Partington Steel & Iron Company are:

Gas passing per hour per machine, 500,000 cu. ft.; dust in gas before cleaners, 176 grains per 100 cu. ft.; dust in gas after cleaners, 0.88 grain per 100 cu. ft.; power used to drive each machine, 11 kw., 14 B. hp.; pressure used in passing the gas through the cleaners, ⅜ in. of water gauge; water used in each cleaner, about 6000 gal. per minute.

The water used in this plant is canal water, but we use sea water elsewhere, and also water that has been settled and cooled and returned to the cleaners. The ground space used is 10 x 10 ft. for each cleaner. The foundation is a ring of concrete 6 ft. 6 in. in diameter and 2 ft. 6 in. high. The cleaners themselves remain perfectly clean. There is no visible deposit of dust in the stoves or the boiler flues.

Capital Outlay.—The price of each No. 8 machine is $3250. The outlay per machine erected and ready for use, with 20-hp. vertical spindle, 600 r.p.m. motor, motor panel, wiring and foundations, but not including gas mains and water supply, would be about $3900. No buildings are needed.

Operating Cost No. 8 Cleaner per Year of 8736 Hr.

Power at 0.5c. per kw.-hr.	$475
Depreciation at 10 per cent. per yr.	390
Stores	10
Attendants, 2 men for 12 machines at $7.50 per week	65
Total operating cost exclusive of water supply	$940

A Prospect of Cheaper Platinum

Hitherto Russia has been practically the only source of supply of platinum. Very small quantities have been found in Borneo, Sumatra, Brazil, Colombia, Australia and California, but these sources have contributed not more than 5 per cent. of the total annual production of 13,250 lb. The demand has far outstripped the supply. In 1892 the price was $89 per troy pound; in 1909 it had risen to $338 per troy pound, and in October, 1913, it was $488 per troy pound. One-third of the world's supply is used by the dental industry and another third in electro-technical work. All of this is practically lost to the world. Under these circumstances a large group of industries will welcome the discovery of extensive deposits at Wendem, Westphalia. Over 100 analyses of borings have been made and all showed the presence of metal in amounts sufficient for profitable extraction, the quantity varying from 0.9 to 1.9 troy ounces per cu. yd., which is very rich compared with the Russian deposits. Thus far 500 acres have been examined, which will assure profitable extraction for many years.

The electrification of iron and steel works in Germany makes steady progress, the Allgemeine Electricitäts Gesellschaft having thus far electrically equipped rolling mills to the extent of 760,000 hp.

High Head Horizontal Duplex Pump

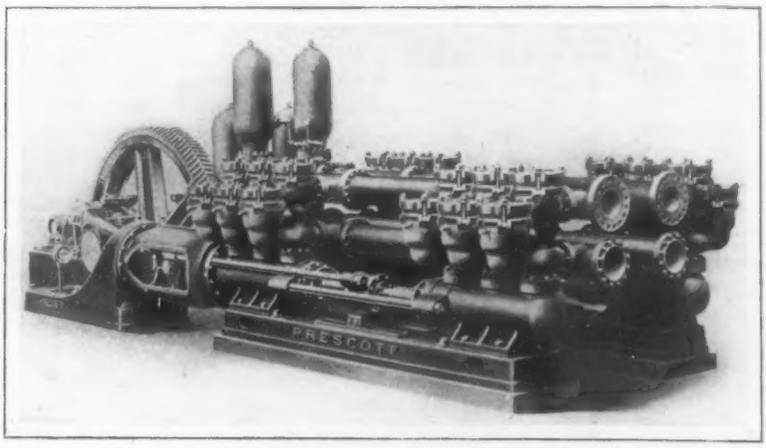
In connection with the installation of the hydro-electric power plant by the Cleveland Cliffs Iron Company, Ishpeming, Mich., illustrated in *The Iron Age*, May 2, 1912, special attention was given to the question of the type of motor-driven mine pumps to be employed in connection with the changing over from steam to electric drive. Another point given consideration was the possibility of mining at a greater depth and the probability of a decrease in the amount of water handled as the depth increased. It was decided to use horizontal duplex power pumps and two machines with plungers 6½ in. in diameter and having a stroke of 36 in. were ordered from the Fred M. Prescott Steam Pump Company, Milwaukee, Wis.

The capacity of these pumps is 1000 gal. per min. each against a head of 1000 ft. at a speed of 49 r.p.m. The pumps are driven by induction motors through a single reduction herringbone type gear. The full load speed of the motor is 580 r.p.m., so that the ratio of reduction is approximately 1 to 12. The gears are steel castings, which were made in two sections and bolted together, and the pinions are cut from the solid blanks.

With a view to keeping the pump in service when the mining operations were being carried on at a greater depth than at the present time, without exceeding the capacity of the driving motor, a centrally packed design of pump was used. The use of a special type of cross-head enabled plunger changes to be made, to accommodate the pump to the flow of water in the mine without dismantling. For making these changes a set of removable stuffing boxes and smaller size plungers are provided. In this way it is possible to use the pump at a greater depth, but, of course, the capacity is somewhat reduced.

The water end of the pump is of the pot type with hinged covers to facilitate renewals or inspection. It is emphasized that by mounting the entire water end on a heavy planed bedplate correct and continuous alignment and smooth operation are secured. The design of the power end follows the builder's regular Corliss engine practice, but this portion of it can be taken apart for lowering in any ordinary size of mine shaft. Discharge and suction air chambers with charging device and full equipment of oilers, etc., complete the pump, which is connected to the motor by a flexible coupling.

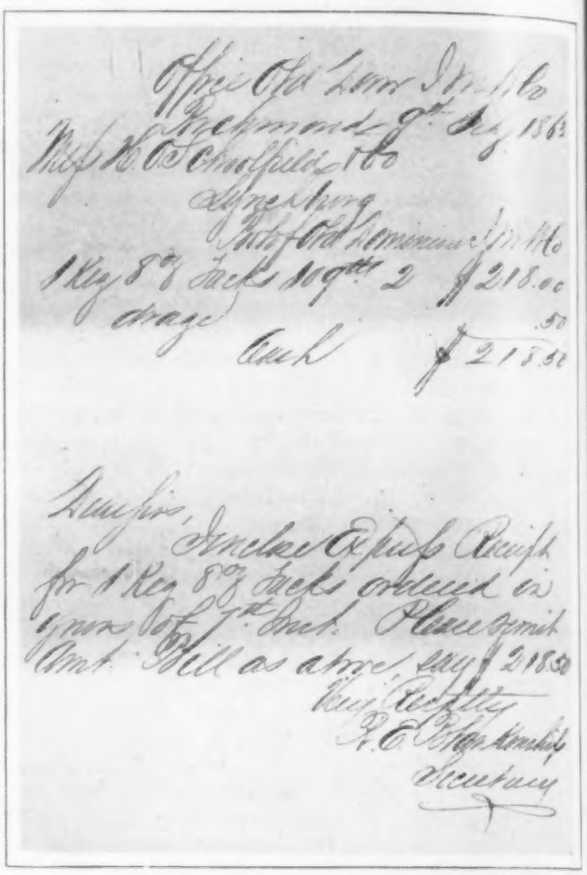
In the series of tests made by the purchaser after the pump was installed an over-all efficiency of over 80 per cent. was secured. This figure covers all the losses between the electrical supply circuit and the discharge outlet of the pump.



One of a Pair of 1000-Gal. Motor-Driven Horizontal Duplex Pumps Installed at a Michigan Iron Mine for Pumping against a Head of 1000 Ft.

A Reminder of Southern War Times

H. R. Wayt, secretary and treasurer of the Old Dominion Iron & Nail Works Company, Richmond, Va., has forwarded to us a bill covering a



A Reminder of Southern War Times

shipment of tacks made by his company in 1863. This bill was received from A. T. Powell, cashier of the Lynchburg Traction & Light Company, Lynchburg, Va., who forwarded it with a letter stating that a contractor in tearing down an old building in that city a few days before had found this document and given it to him. The bill is reproduced in facsimile herewith.

At the time this bill was rendered by the Old Dominion Iron & Nail Works Company, the country was in the throes of the civil war and Richmond was the seat of the Confederate Government. At that time Confederate currency was used in the conduct of business within the Confederate lines, and the very high price named in this bill—$218 for one keg of only 109 lb. of 8 oz. tacks—is due to the fact that it was payable in this greatly depreciated currency. It is remarkable that such a small price as 50c. was charged for drayage. Accompanying the bill was a receipt from the Southern Express Company whereon the statement is made that the keg of tacks is received for forwarding at "shipper's risk." The bill and the express receipt were found in an envelope bearing two Confederate States 5-c. stamps.

It will be observed that the bill is a specimen of the graceful chirography of the late R. E. Blankenship, who for a number of years after the war represented his company at trade gatherings and made many warm friends in the North.

RAPID ENGINE BUILDING

What is Believed to Be a Record in Building Two Blowing Engines

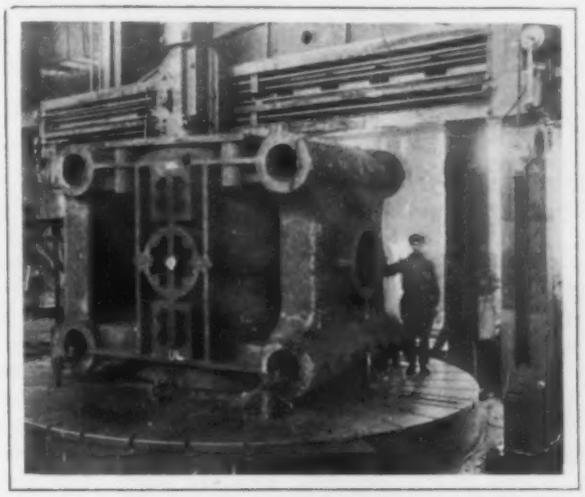
A world's record in building large engines was recently accomplished according to the Mesta Machine Company, Pittsburgh, in the case of two horizontal cross-compound blowing engines for the Woodward Iron Company, Woodward, Ala. The first engine was completed and loaded on board cars at the Mesta works in West Homestead, Pa., in 38 days, and the second one in 59 days from the date of signing the contract at Woodward. Each of the engines contains one high-pressure steam cylinder, 48 in. in diameter, one low-pressure steam cylinder, 84 in. in diameter, and two air cylinders, 84 in. in diameter, with a stroke of 60 in.

On November 15, 1913, a contract was signed with the Mesta Machine Company for the two engines, one to be delivered on cars at the Mesta works in 90 days and the other in 120 days. As it was doubted that the company could make delivery on the dates specified, the contract included a bonus and penalty clause. None of the parts of the engines was in stock, as all engines of this size and type are built on special orders. November 15 fell on Saturday, so that the work on the engines was not started until Monday morning, November 17, the time when the order was received at the Mesta works. On December 22 the first engine was completely assembled on the erecting floor.

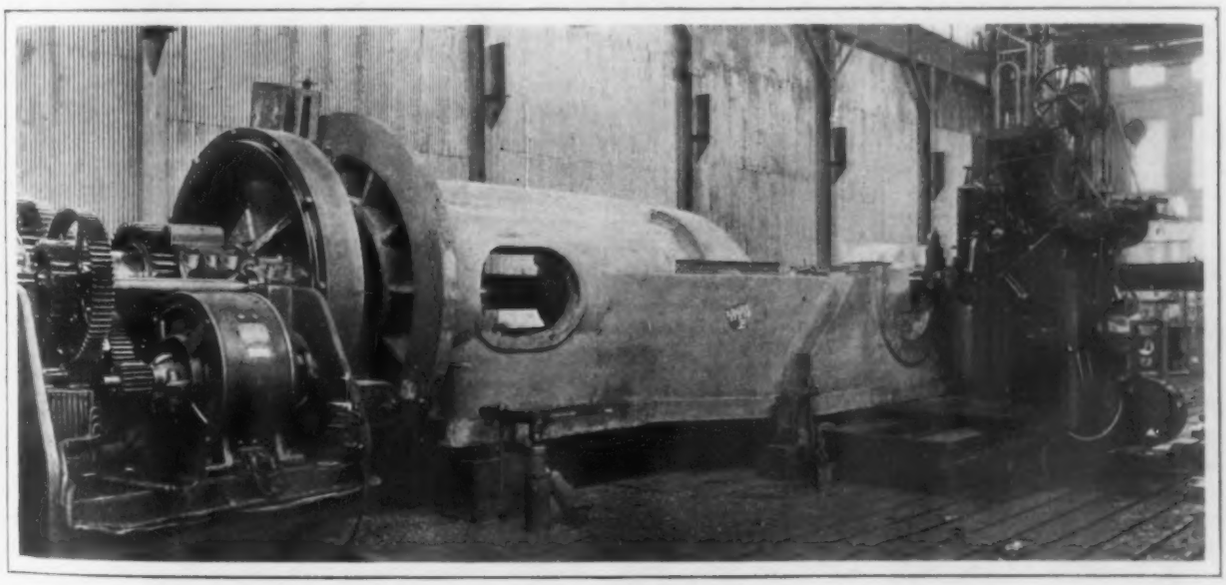
On December 23, at 6 p. m., the engine was loaded on 16 cars ready for shipment, which was just 38 days from the time the contract was signed. The engine was completed 53 days ahead of the time called for in the contract. Arrangements were made with the Pennsylvania Railroad to run the 16 cars as a special train to Cincinnati and with the Louisville & Nashville Railroad to take it through as a special train from Cincinnati to Woodward, Ala. The train arrived at Woodward on the morning of December 27, 57 hours from the time it left the yards of the Mesta Machine Company. It is believed that this is not only the world's record in building engines of this size, but in delivering 900,000 lb. of machinery a distance of 834 miles, this being the distance from Pittsburgh to Woodward.

The second engine was completed on the erecting floor on January 12, 1914. It was loaded on cars which left the plant on January 13. This was just 59 days from the date of signing the contract and was less than half the time called for in the contract, which was 120 days.

The engines weigh 1,800,000 lb., and contain 10,210 pieces. The lightest piece weighs ¼ oz., and the heaviest piece 94,550 lb. The accompanying illustrations show one of the 84-in. Corliss steam cylinders being machined on a 20-ft. boring mill, and one of the low-pressure bedplates on a large surface plate, with one machine boring the guides and facing the flange and the other planing the main bearing. The air end is equipped with the Iversen automatic inlet and outlet valves. The engines are designed for 30 lb. air pressure and to run at a speed of no less than 80 r.p.m.



Machining One of the 84-in. Corliss Steam Cylinders on a 20-ft. Boring Mill at Plant of the Mesta Machine Company



Low-pressure Bed Plate on a Large Surface Plate in the Plant of the Mesta Machine Company, One Machine Boring the Guides and Facing the Flange While Another is Planing the Main Bearing

Removing iron particles from ground scrap rubber in the reclamation plant of a rubber mill and extracting the metallic iron from crushed slag in the steel plant are two new applications of Cutler-Hammer magnetic separators that have recently been made. The separating is effected on a belt over the magnetized pulley which picks out the metallic particles and allows the remainder to be thrown to a conveyor or chute.

THE SLAGGING GAS PRODUCER

Present State of Development—Ideal for Gasifying Coals with a Fusible Ash

The advantages and disadvantages of the slagging gas producer, together with some historical facts, were presented by William H. Blauvelt, Syracuse, N. Y., at the fall meeting in New York of the American Institute of Mining Engineers in a paper substantially as follows:

The type of gas producer in which the ashes are fluxed and run off as slag was among the very earliest made. Ebelmen built the first one in 1840 at Audincourt, France, only a year after the installation of the first gas producer of which we have record. Charcoal was used as the fuel, with blast-furnace slag and clay as flux. My interest in this type of producer began when as a boy I saw the fluxing producer at Chester, N. J., which was invented by W. J. Taylor, and described by him in 1881. This producer was invented independently by Mr. Taylor to meet the difficulties he experienced in making producer gas for roasting sulphurous iron ores.

It will be of interest to review briefly his description of his producer. It was built like a small blast furnace, having a hearth 24 in. in diameter and 24 in. high. The bosh angle was 25 deg. from the vertical; the diameter of the bosh 4 ft. and at the top 8 ft.; the total hight 12 ft. The producer contained one water-cooled tuyere 12 in. above the bottom, with a 1½-in. nozzle; depth of the coal above the tuyere, 6 ft. Mr. Taylor mixed the coal with from 30 to 40 per cent. of basic blast-furnace slag to flux the ash. Occasionally some limestone was also used, but never limestone alone, as the use of the furnace cinder gave a larger volume of slag and made it easier to maintain a proper fluidity. The producer was blown with a small Weimer blowing engine, delivering 300 ft. of air per minute, at from 1 to 1.5 lb. pressure. The slag was tapped every 2 hr. and was black and glassy in appearance. Broken or egg size anthracite was used. The fine sizes of anthracite could not be made to work. Mr. Taylor expressed the belief that bituminous coal could be used if not too fine, but no experiments were made with this coal. Runs were made of four weeks' duration, with no stops or changes. Mr. Taylor reported the following advantages:

1. Excellent gas, very uniform in quality. The high fuel bed permitted no air to pass unconsumed, and the gas was almost entirely free from carbonic acid.

2. No cleaning of the producer to remove ashes, so no waste of coal and no cessation or irregularities in the flow of gas.

3. Quantity of gas easily controlled, and "anyone familiar with blast-furnace practice can run it, particularly if cinder for fluxing is available."

POWER REQUIRED FOR BLOWING

The power required for blowing the producer for gasifying 200 lb. of coal per hr. was 1.5 hp., or, assuming 3 lb. of coal per hp., 2.25 per cent. of the coal gasified. This consumption of steam compares favorably with ordinary producers, but the rate of gasification, about 16 lb. per sq. ft. per hr., was not remarkable for the size of fuel used. Mr. Taylor did not continue the operation of the fluxing producer, mainly on account of the skilled attention required in its operation. A man "familiar with blast-furnace practice" is often not available for the operation of producers. The high pressure of blast used and the necessity for employing a blowing engine were also among the disadvantages. He did not state why only the larger and more costly sizes of anthracite could be used, but at present comparative prices this would be a serious objection.

There appears to be no further record of experiments with the slagging producer until within the last few years. A battery of "S. F. H." slagging producers was installed at the glass works at Gironcourt in 1907, and this plant is reported to be still in operation, furnishing gas to the glass works. In the report of the operation of this plant there is no reference to the type of flux used, but it is reported that all kinds of fuel are successfully gasified, no matter what the content of ash, the only necessity being that the fuel contain sufficient fixed carbon to develop heat to gasify the carbon and fuse the ash. It is claimed that the heat required to fuse the ash is much less than the equivalent of the carbon lost in the ash of ordinary producers. One coal containing from 20 to 25 per cent. of ash gave a gas containing from 2 to 3 per cent. of CO_2, 28 to 30 per cent. of CO, and 9 to 10 per cent. of H and CH_4.

WORK OF THE BUREAU OF MINES

The most recent work done with the slagging producer is that described by the Bureau of Mines, Technical Paper, No. 20. This work was done at the Pittsburgh Laboratory of the Bureau, with a view to determining the value of this type of producers for utilizing low-grade fuels. It does not appear from the report of these tests that the slagging producer gives results essentially superior to other types of producers for gasifying low-grade fuels. The experiments at the Coal Testing Plant of the Bureau at St. Louis in 1903 and 1904 showed that fuels containing very high percentages of ash could be successfully gasified in producers of the ordinary type.

The report of the Bureau of Mines does not give the dimensions of the producer used, but six air tuyeres were employed, and in addition four separate steam tuyeres located above. On account of the extremely high temperatures, it was found necessary to provide pipe coils in the brick lining for water cooling, and magnesite brick was used between the coils and the fire. The cooling coil extended over a space of 20 in. above the air tuyeres. The blast pressure used was from 5 to 16 in. of water, and it was found advantageous to pre-heat the air to about 440 deg. F. Steam was employed at times up to 0.75 lb. per pound of fuel gasified, and it was found that this produced no chilling effect on the slag, as the steam was introduced above the point of highest temperature. It was found difficult to operate this type of producer intermittently without trouble from the chilling of the slag, so it does not appear that it would be satisfactory in cases where gas is required only in the day time, for example. The analysis of the gas showed high CO and low CO_2 content, the latter being as low as 1.5 per cent., but no analyses are reported showing the effect of steam on the composition of the gas.

The experiments developed a number of difficulties in the fluxing of the ash, and it was found that the theoretical percentage of limestone was not nearly sufficient to produce a fluid slag. Frequently large quantities of fine ash blew over with the gas, "because of the heavy air blast," and probably some of the limestone was blown over with it. One occasion is reported where practically all of the ash and limestone escaped in this way. Comparing the air pressures reported with those used in producers of the ordinary type, it would be interesting to observe, in further experimenting, if a careful

proportioning of the depth of the fuel bed to the rate of combustion would reduce the trouble from this source.

When the conditions were right and the operation of the producer was maintained continuously there was no trouble in tapping off the slag in a satisfactorily fluid condition, and in maintaining a uniformly high quality of gas. The bureau has been carrying on experimental work since the publication of the above report, and we hope to have before long the results of this additional work.

A FRENCH PRODUCER THE LATEST

The latest work with the slagging producer is described in a French patent issued to E. Servais, January 21, 1913. In this producer there are two sets of tuyeres, one set arranged just above the fire zone and supplied with steam or gas to reduce the temperature in the fuel bed by its decomposition. A second set of tuyeres is arranged just below, through which the air blast is admitted. These tuyeres are set in an eccentric ring, in order that a whirling movement may be given to the air in order to agitate the molten slag in the crucible. The inventor claims that this rapidly melts down any solid lumps that may form. A combustion chamber is arranged beneath the crucible in which a mixture of gas and air may be burned to help in maintaining the temperature above the fusing point of the slag. In operating this producer the fuel is sprayed with lime water, or mixed with a suitable amount of basic blast-furnace slag.

FIELD OF THE SLAGGING PRODUCER

The work done thus far with the slagging producer does not indicate that the problem has been thoroughly worked out, and there is much experimenting to be done before this producer can be put on a commercial basis. The increasing cost of the higher grades of fuel, and the large amounts of low-grade fuel that are available in almost all parts of the country, make the perfecting of a producer that will successfully gasify these low grades a most interesting and important problem.

There is one field where the slagging producer would have material advantages. It would be ideal for gasifying coals having a fusible ash. No matter how badly the ash might clinker in an ordinary producer, it would have no terrors for the slagging producer; in fact, the more fusible the ash, the better. Such coals are ordinarily gasified with the use of an excess of steam, which is not only costly to generate, but injurious to the gas, as much of it passes through undecomposed. There are many of these clinkering coals which are objectionable in the ordinary gas producer, and if the slagging gas producer can be worked out so that the cost of operation is about on a par with other types, it will find a field of usefulness waiting for it.

The Deforest Sheet & Tin Plate Company, Niles, Ohio, states, regarding its recent increase in capital stock from $400,000 to $600,000, that the increase is made to take care of additional working capital requirements incident to the increased capacity of the plant. This has been practically doubled in the last 18 months, the expenditure for which has hitherto been made from the earnings of the company. The new stock was all subscribed for pro rata by the old stockholders. The stock has a par value of $100, but as it now has a book value of over $200, and the new stock will be issued at par, the stockholders are substantially benefited. The company paid cash dividends the past year at the rate of 1 per cent. per month and in addition purchased in the market one-half of its outstanding bonds.

An Automatic Safety Car Hopper Wrench

For use in opening the hoppers of drop bottom or side dump cars, the Hess-Steel Castings Company, Witherspoon Building, Philadelphia, Pa., has brought out a new type of wrench for which the special feature of absolute safety is claimed. Other advantages claimed for the use of this wrench in railroad yards and industrial plants where bulk material is being received in carload lots are a saving in the time required for opening and closing the doors and durability.

It is pointed out that when an ordinary wrench is being used, it is necessary for the operator to

A Recently Designed Safety Wrench for Use in Connection with the Opening and Closing of the Doors of Hopper Bottom and Side Dump Cars

get out of the way quickly as the door opens after being started. In use the new wrench is placed on the square end of the hopper shaft with the small handle of the reversing device A in the position shown in the accompanying engraving. The wrench is then lifted until the pawl B, which is being pressed down by the finger, engages the ratchet and then removes the pressure from the car dog. The car dog is then released by lifting it with the finger while the wrench is held steady. The next operation of opening the hopper is the one where this wrench is particularly advantageous as the operation is made automatically safe. While the car dog is up, the wrench is quickly lowered and the pawl B springs out, allowing the ratchet to revolve freely as the door drops. In this operation the pawl is automatically thrown out of engagement with the ratchet at the instant the wrench is lowered sharply so that it is practically impossible for the operator to be caught. If the door does not start promptly the handle is raised and pressed down with the safety pawl still out of engagement, thus forcing the door to open. For closing the hopper the car dog is released and the small handle of the reversing device A is pushed into a downward position. This makes the wrench an ordinary ratchet one and enables the shaft to be moved around until the door is closed.

The body of the wrench is a special wrought-iron casting and the working parts, which are all inclosed and protected against accidental damage, are made of steel castings. The hole in the end of the wrench is arranged to fit the 2-in. square M. C. B. spindle end, even though it may be badly battered. Where cars are not equipped for this standard size of spindle a bushing or special socket for smaller size of square ends can be supplied at an extra cost.

It is stated that with this wrench it is possible for one man to open a hopper door in about half the time required by several men with an ordinary wrench, and at the same time there is practically no danger.

The Baldwin Locomotive Works, in 1913, built 2025 locomotives, against 1618 in 1912. Of these 214 were for export to foreign countries.

DEVELOPMENTS IN ALUMINUM

Competition with Copper—Increased Production in the United States

From a review of the aluminum industry in the United States in 1913, by the Mining and Scientific Press, San Francisco, the following is taken:

As a conductor for electricity, aluminum at 20c. per lb. is on a par, from the standpoint of cost, with copper at 12c. to 13c. During 1912 aluminum ranged between 18c. and 26c. per lb., while copper ranged between 14c. and 17½c.; in other words, sometimes copper was the cheaper and sometimes aluminum, but the latter showed a range of 8c. against 3½c. for the former. The manufacturer and consumer of electrical conductors, therefore, had comparatively little incentive to commit themselves to the use of aluminum, the more so as the supply of the metal was comparatively limited and a few large purchases might send it skyrocketing. This is not all the story, however, for aluminum is comparatively weak in its tensile strength, while the larger cross-section of the equivalent conductor made the wind load and ice and snow load on wires much greater than is the case with copper. To support the wires would require more poles or towers, and what was saved at one pocket was lost out of the other. This difficulty has now been overcome by the use of a composite cable of several aluminum wires about a steel wire, and the transmission line of the Los Angeles power project uses such a cable for its 275 miles of length. There is another difficulty: aluminum, in spite of the early claims made for it, is much more subject to corrosion than is copper, and the same is true of steel. We understand that a means has at last been found of overcoming this drawback, and that henceforth the item of relative cost will practically be the determining one. Assuming that 14c. to 15c. is the normal price for copper, it seems probable that aluminum will henceforth be a keen competitor with it when selling for 20c. per lb.

EXTENDING THE USE OF THE METAL

It must not be assumed from this that increase in the output of aluminum will be followed by a corresponding decrease in the consumption of copper, for there is almost an infinite variety of uses for aluminum which can absorb much greater stocks of the metal. Its use in the manufacture of cooking utensils, competing with enameled ironware, is known to everyone, and the consumption in this way will certainly increase greatly when the selling price of the finished article is brought closer to the cost of the metal, and the latter is also reduced. Another field, yet unexploited, is the use of the metal for interiors, supplanting wood work. In the modern business office almost the only articles still made of wood are the desks and chairs, and it is quite possible that these will soon be supplanted by metal, yielding to the demand for fireproof construction. Painted sheet steel is now the favorite material for all metal construction, but unpainted aluminum would be much more satisfactory from the standpoint of illumination, since it quickly acquires a gray "mat" surface which diffuses light without creating a glare. The cost of aluminum is now too high to compete with steel in this way, but what the future position of the two will be must be left for the future to show.

Much aluminum is used in ways which are not impressive but which consume a large amount of the metal. Aluminum "novelties" have become so common that they have lost their novelty, but have proved so convenient that their use is likely to increase rather than decrease. Aluminum foil is now being used, displacing to some degree tinfoil. The powdered metal, known as aluminum bronze powder, is used in painting, lithographing, printing, and as a constituent of explosives and a patented source of heat. The early difficulties in working the metal have now been largely overcome, and the manufacture of aluminum tubing, for example, is rapidly increasing. It is not remarkable, therefore, that the consumption in this country increased from 46,000,000 lb. in 1911 to 65,000,000 lb. in 1912, coincidentally with a steady increase in the price from 18c. in January, 1912, to 26c. in December. It is important to note, however, that even this amount was only 7½ per cent. of the copper consumption during the same period.

NEW PRODUCERS

No review of the outlook for aluminum would be complete without some reference to the sources of the supply of the metal. The Aluminum Industry Aktéen Gesellschaft is the largest producer, its plants in Switzerland, Germany and Austria having a capacity of 32,000,000 lb. per year. This is closely followed by the Aluminum Company of America, with plants at Niagara Falls and Massena, New York. The British Aluminum Company, with two plants in Scotland, is a good third, and there are numerous other plants in France, Germany, Switzerland, Norway and Italy, which contribute to the total output. The Northern Aluminum Company at Shawenegan Falls, Canada, is the only other plant now producing the metal on the North American continent. However, the Southern Aluminum Company has under construction near Whitney, N. C., a plant which will nearly double the present American output when it is in operation. The power supply is to be obtained from Yadkin River, and the technical work is under the direction of French metallurgists. The Aluminum Company of America is also building a new plant at Marysville, Tenn., and is said to have contracted for 20,000 electrical horsepower from January 1. However, the power company found it necessary to rebuild the dam and these two plants in the south are both likely to begin operations toward the end of the year. Perhaps the most important effect of this will be to give to manufacturers more than one domestic source of supply, and manufacturers who have heretofore been deterred by this fact from committing themselves to the use of a product in which there is now no open market will be encouraged to begin or increase their use of aluminum. The tremendous increase thus made in the domestic output of aluminum is certain to have a marked effect on the uses and applications of the metal, and it will be interesting to observe whether the increased consumption will take care of the increased yield, or whether a recession in the price will be the result.

The Central Boiler & Sheet Iron Works, Inc., has succeeded the Central Boiler & Sheet Iron Works, a partnership, at 583 South Harding street, Indianapolis, Ind. The incorporated company has added considerably to the equipment of the plant and continues the manufacture of boilers, tanks, stacks and other kinds of plate metal work.

The Associated Foundry Foremen, Philadelphia, Pa., held their regular monthly meeting on the evening of January 14. B. L. Spain, General Electric Company, presented an illustrated address on "Centrifugal Blowers for Foundry Use."

Status of the Railroad Rate Advance Case

The Need of Expedition Recognized, but Opposition of Shippers, It Is Alleged, Compelled Delay

WASHINGTON, D. C., January 21, 1914.—The decision of the Interstate Commerce Commission, just announced, to grant hearings to protesting shippers in the so-called Eastern advance freight rate case, though not altogether unexpected, is a disappointment not only to the officials of the railroads interested, who are asking a 5 per cent. increase in Eastern classification territory, but also to many shippers who are either in sympathy with the railroads or who are anxious that this important controversy should be settled at the earliest practicable date. No schedule for the hearing of the opposition in this case has yet been arranged, but February 2 is tentatively fixed as the probable beginning of the hearings, which Interstate Commerce Commission officials declare will continue until all parties have been heard. There is little probability that these hearings will be terminated before March 1 and thereafter the commission will hear arguments on the record, and presumably will allow reasonable time for the filing of briefs. The consideration of the voluminous mass of evidence will be a huge task and the spring is likely to be well advanced before a final decision is reached.

THE RAILROADS' STRONG CASE

The present case is based upon tariffs filed by the Eastern railroads early last fall, effective November 15, making a 5 per cent. advance in freight rates. These tariffs were suspended by order of the commission and an inquiry as to the reasonableness of the proposed advance was begun in the latter part of November. The railroads presented their case promptly and supported their plea for an advance with such evidence as at once created a strong impression that the commission would approve the new tariffs; in fact, numerous premature reports have since gained circulation to the effect that the commission has actually decided to comply with the request of the roads.

After hearing representatives of the railroads the commission prepared a series of interrogatories in which calls were made for a large amount of information not wholly covered in the evidence before the commission. These were made returnable January 31, and it was then generally assumed that in view of the excellent showing made by the carriers the commission would act upon the information already secured and that to be obtained from the answers to the interrogatories. As the protests of shippers began to accumulate, however, the commission decided it to be advisable to grant hearings in opposition to the proposed increases. At the outset the only protestants were the shippers of bituminous coal and petroleum, but the docket now includes such commodities as coke, sand and gravel, brick, plaster, cement, ice, flour, sugar, coffee, etc. Few if any representatives of the iron and steel industry are among the protestants and then only indirectly. One steel producer has protested against the proposed advance as applying to coke. Iron and steel producers appear to be generally of the opinion that the increase asked for is reasonable and the impression is strong that if the commission approves the new tariffs the roads will soon be placed in a position where they can again take up their suspended programmes for betterments, increased equipment and improved service.

DECLINING NET EARNINGS WITH HIGHER GROSS

The very general impression that the roads will be granted an advance, even if the entire 5 per cent. increase is not allowed, is based chiefly upon the conditions now prevailing in Eastern classification territory, as described to the commission by representatives of the carriers, notably by President Willard, of the Baltimore & Ohio Railroad, and President Delano, of the Wabash system. It would be difficult to produce more effective arguments than have been presented on behalf of the Eastern railroads by these officials. During the fiscal years ending June 30, 1911, 1912, and 1913, the railroads interested in this movement increased their property investment $659,862,000. The gross earnings during the last fiscal year were $1,424,119,000, or $186,775,000 greater than they were in the fiscal year 1910. The operating expenses and taxes during the last fiscal year for the same roads, taken at $1,087,364,000, were $203,087,000 greater than they were in 1910; so the net result, after paying operating expenses and taxes, was actually $16,311,000 less than it was in 1910, notwithstanding the fact that over $659,000,000 had been spent in the meantime for additions, betterments and equipment. These companies apparently not only failed to earn any return whatever upon the new capital invested, but even saved less from gross earnings as return upon the original property investment than they were able to show before this large expenditure was made. Thus it appears that the new capital invested in railroads in official classification territory during the last three years has earned little or no return; in fact, these properties generally are actually earning less net than before the $659,862,000 had been spent.

COURSE OF WAGES AND OTHER COSTS

The wage question also confronts the carriers as a bar to increased earnings. The award recently announced by the arbitrators in the matter of the application for increase in wages by the conductors and trainmen in Eastern territory, it is estimated, would give approximately $6,000,000 increase in wages annually to these employees. The total wage payment of the Baltimore & Ohio system alone has been increased by an amount in excess of $4,000,000 per annum, comparing 1913 with 1910, due to increased rates of pay and changes in working conditions. This indicates in a general way what has also taken place with each of the other companies.

Increased cost of materials since 1910 is another factor in the problem. The advances in fuel and track ties alone cost the Baltimore & Ohio system more than $500,000 above what they would have been had prices remained as in 1910.

Taxes have also added to the burdens of the carriers. The amounts paid by the companies parties to this proceeding, has shown constant increases in 10 years, particularly in the past three years. The increased payment in 1913 over 1903 was $28,720,000 and the increase incident to the last three

years was $11,579,000. In the case of the three railroad systems selected by the commission as typical the amount of money actually paid as taxes in 1913 was $31,216,000, being $7,854,000 more than was paid in 1910.

Legislation, both State and Federal, enacted during the last 10 years, has brought steadily increasing burdens. Included in this are employers' liability and compensation acts, full crew laws, so-called semi-monthly pay laws, safety appliance and standardization of equipment acts and acts requiring the elimination of grade crossings, etc. The effect of the so-called full crew laws alone has been to increase the expenses of these carriers more than $4,000,000 per annum.

The carriers have also been called upon to meet a public demand for a higher standard of service than ever before; and while it may be that the wishes of the public in this particular have not been fully realized, nevertheless much has been done in that direction. The carriers have also been obliged to pay high interest on money borrowed for betterments and new equipment.

HIGHER EFFICIENCY NOT SUFFICIENT

The general basis of their rates has been lowered during the last three years, the railroads argue, and there has been an important increase in the power of their engines and the carrying capacity of cars, these changes having been made in the hope of decreasing cost of operation. The officials of the roads declare their inability to effect savings by any reduction in wages and no recourse appears to be left save the small increase in freight rates which the commission has been requested to approve.

The general feeling among those who have closely followed this case that the commission will grant at least a measure of relief to the roads is highly significant, as is also the feeling in the iron and steel trades that nothing could be more advantageous to that industry at this time than the allowance by the commission of the advance sought by the carriers. It is to be regretted that there is no method of expediting the hearing of this important case. It can be stated, however, that the members of the commission are all alive to the desirability of reaching a decision at as early a date as possible and it is believed that very little time will be lost after the presentation of the case is concluded in acting upon the carriers' petition.

W. L. C.

Rogers-Brown Salesmen Meet

The annual meeting of officers and salesmen of Rogers, Brown & Co. was held at the company's Cincinnati offices last week. Those present were William A. Rogers and W. T. Shepard, Buffalo; M. C. Armour and E. L. Billingslea, Chicago; D. B. Meacham, J. K. Pollock, F. W. Miller, F. W. Bauer, W. H. Knight, A. J. Wentworth, H. E. Turner, H. B. B. Yergason and F. S. Meacham, Cincinnati; H. W. Fernald, Boston; J. C. Waldo, Buffalo; R. W. Clark and J. C. Claussen, New York; N. H. Swayne and H. C. Thomson, Philadelphia; J. H. Darragh and W. P. Cheney, Pittsburgh; Sterling Hubbard and Harwood Wilson, Cleveland, and J. C. Mears, St. Louis. On Tuesday a noonday luncheon was served at the Cincinnati Business Men's Club, and in the evening D. B. Meacham entertained the party at his residence in Avondale.

The Penn Steel Casting & Machine Company, Chester, Pa., announces the building of a complete pattern shop, putting it in position to furnish patterns for orders placed with it for castings.

THE BUSINESS OF PURCHASING SUPPLIES

One Buyer Tells How He Gets Lowest Prices—Another Buyer Gives His Views

The same mail on a recent day brought two articles by purchasing agents, giving for publication the results of their experience and observation. One tells of his methods in the effort to get lowest prices for the benefit of his employers and the other discusses the broad question of a purchasing agent's business. They are presented below:

1. Purchasing Agents' Methods

It is rather strange that so many experienced buyers still think the lowest prices can be had only by beating down salesmen, using the price received from one to make another lower his price. The head of the purchasing department of the American Brake Shoe & Foundry Company recently stated publicly that he never buys at the price first quoted to him. His subordinates beat the salesmen down as much as they can, and then he "takes a hack at them" himself. This describes perfectly the methods used by at least half the purchasing agents.

In spite of the standing of many of those who use this method, it does not seem to me the best method. I do not mean on any moral ground, for my method may be no better in that respect, but considering only the results obtained. To get the very lowest prices in that manner takes a lot of time on the part of high-salaried men. It also takes a lot of patience and is apt to put everybody concerned in a bad humor.

Even then the results are uncertain. A really low price may thus be secured, but the salesmen have all found out just about what concession may be demanded from the first price, and next time they will make their first price high enough to allow for the concessions. The result is that after several contracts have been placed all parties get to know each other pretty well, and the haggling over the price becomes a meaningless preliminary that only wastes the time of several expensive salesmen and a still more expensive purchasing agent. If the buyer must bluff the salesman, why not do it before he names his price? It can be done just as effectively then, and will leave everybody in a much more cheerful frame of mind.

After getting a clear idea as to quality and quantity, my method is to tell the salesman to get his lowest price and submit it, say next Thursday before two o'clock, and that all the velvet will have to be scraped off, for the best bid at that time will get the business. I make it clear to him that there is to be no haggling or shaving of prices after they are once in. Then I keep my word, and when the announced time comes give the order to the best bidder, no matter what reductions others may offer later.

AN EXAMPLE OF MAKING A CONTRACT

Suppose, for example, that your plant uses two cars of coal a week, and, for a 25-car contract the best bid at the appointed time was $4 a ton, but a little later one of the other salesmen catches you and tells you that he is willing to reduce his price to $3.95 a ton with the same terms. Tell him there is nothing doing; that he should have given you his lowest price when you asked him for it. Then go right ahead and sign up the contract for the 25 cars of coal at $4 a ton to be delivered as wanted within

six months. The concession that has been offered amounts to very little anyway and is not worth haggling over. By letting it go you can probably more than make it up on the next contract by reminding the salesmen of it so that they will give their lowest prices when asked.

However, if that five cents a ton really worries you and you feel that it must be saved, it can be gotten back for all but a few cars. The contract being signed for 25 cars to be delivered as wanted within six months, have the seller ship one car a week. This is only half the coal needed at the plant but is just right to fill the contract on time. As there is probably some coal on hand, and a few cars to come under a former contract, you will not hear anything more about it for three weeks or a month. About that time you can call in the salesman that represents the coal people having the contract and tell him how you got stung when you signed, and that others offer coal at $3.95 a ton. Tell him that if he will get authority to reduce the contract price to $3.95 you will agree to increase the contract quantity to 37 cars to be delivered as wanted within nine months from the date of the original contract. He will have to put it up to his headquarters, but he will be on your side because of the commission on the extra 12 cars. His firm will almost always fall for this because it looks like that much new business to them and because a dissatisfied customer is a bad asset.

HOW A CONTRACT IS WEAKENED, YET NOT BROKEN

But if the firm refuses to alter the contract, there is another way to try. Get new bids on 12 cars, or see the salesman that offered you the $3.95 price and offer him a 12-car contract at that price. If he don't take it, then the $4 price you are paying must be all right after all. If he takes it, have him ship two cars a week. The plant will now be getting three cars a week, and in two or three weeks you will hear that it is overstocked. Then stop the $4 coal entirely. About this time the $4 people will probably hear about the two cars a week you are getting from the other seller and will probably send someone to find out what the trouble is. At this stage the contract only requires you to take 18 more cars within the next 18 weeks, so you can, if necessary, sit tight and take no coal on that deal for the next two months, without running any danger of breaking the contract. But long before that the firm will conclude that it is a question of letting the business get away, making the concession or having a lawsuit. When the seller is ready to talk it over give him a good increase in the quantity under contract, but always get a corresponding extension of time. It is a good rule to see that every contract is elastic enough either to let you get your full supply under it or only half under it and the rest elsewhere.

If the market price should go down the above-described process can also be used, and may even be worked several times on the same contract. When the market finally begins to go up again you find yourself very nicely fixed with a big lot of supplies contracted for at the bottom price. Just why the supply people will stand for this process I don't fully comprehend, but most of them will.

I suppose some will ask why go to all this trouble to get a contract changed when it would have been easier to get it changed before it was signed. Well, with my method these difficult situations seldom arise, and most of the buying is done quickly at uniformly low prices. As sure as the other method gets even the smallest start, you drift back to a point where a lot of time is consumed in haggling over prices and on the slightest relaxation or hurry you pay high prices.

2. Buying, a Science

It has been said by inexperienced persons that the purchasing agent of any firm has a very easy time of it; that all he has to do is to sit at a desk and order from time to time by wire or letter such articles as are required. Little do they realize, however, that every article bought has to be ordered from the maker that has the best goods, that can make the required delivery, and which will name a price that is right.

In these days of keen competition it is the house which delivers the goods that gets the business. In order to take care of this the buyer has to be prepared, at a moment's notice, to make contracts with several makers for the material for a special order, that has just been taken by the sales department, and on which a delivery date has been promised before it was known how long would be required to procure the needed parts. So far so good, but here is where the buyer has to put in his fine work, it being practically up to him to keep the delivery promise given. He sends out his requisitions, expecting prompt shipment. Maker after maker comes back with the statement that his stock of this material is exhausted, but that he will make shipment from his mill direct. Where there are a large number of orders to be given out, it can readily be seen what the buyer has to contend with.

The buyer must study the markets, just as the investor studies the stock market. He must be able to tell by glancing at his records just how certain lines have been running for the previous few months, or perhaps years. He must know whether or not there are seasons when it is advisable to buy. He must also take into consideration whether or not the interest on investments would not offset paying a little higher price and procuring the material as required.

It is a great mistake to hold a buyer strictly to a requisition. It should be his privilege to question and suggest changes, as he is constantly in touch with the outer world and gets new ideas and views from other men.

To the average person, price is the only thing to be sought for, but the efficient buyer makes price his last consideration. He must first be careful to get that which is the very best suited for his requirements. Next comes the delivery. It is folly to buy an article and have it delivered a year hence, even at a greatly reduced price, if your needs require it at once. While it might look like a saving, the profits to be gained by paying a higher price and getting the material at once would far offset waiting for the delivery of the article at a lower price.

The use of a non-combustible outer covering over the insulation on the stator end connections of turbo-generators and the providing of arrangements for the quick introduction of carbon dioxide gas into the machine are two suggestions made in a paper recently read by G. S. Lawler, electrical engineer, inspection department, Associated Mutual Fire Insurance Company, Boston, before the American Society of Mechanical Engineers to reduce the fire hazard in these machines. Filtering of the cooling air to free it of dirt and oily vapor is recommended to realize all the advantages of the non-combustible covering. A piping system with valves and expansion tanks is suggested for introducing the carbon dioxide, which could be kept in liquid form, the opening of the valves being controlled by fusible links that regulate the closing of dampers in the air inlet ducts.

"WILFUL ACT" OF AN EMPLOYER

Ohio Employers Combine for Protection Taken Away by Court Decision

To remedy a defect in the Ohio workmen's compensation law that under a recent court decision does not protect employers from civil suits for damages, the Industrial Association of Cleveland, an organization of employers, is establishing a voluntary personal injury fund from which will be paid judgments obtained in personal injury cases against the contributors to the fund. Employers throughout the State will have opportunity to join in the movement.

While this fund is being established employers of labor throughout Ohio are making efforts to have the State compulsory workmen's compensation act amended so that they will be assured the protection it was thought the statute provided in return for their contributions to the State insurance fund. Because of a decision recently handed down by Judge Day in the United States Court in Cleveland, employers appear to be without this protection. As a result the Ohio courts will probably again be flooded with personal injury suits, a large share of which are inspired by ambulance-chasing lawyers, and the merits of actions for damages will be decided by juries whose sympathies are usually with the plaintiff. The hope Ohio employers now have for protection is in securing an amendment to the compensation law or in the possibility that the State Supreme Court, should the matter reach it in a test case, may construe the law differently from the Federal Court.

AN EMPLOYER'S WILFUL ACT

The Ohio workmen's compensation law provides that should an employee be injured as the result of the "wilful act" of an employer or his agent or from the failure of an employer to comply with any lawful requirements for the protection of lives and safety to employees, the injured employee has the option of claiming compensation under the law or of instituting a suit for damages in the courts. In the minds of the author of the act, the attorney general and the State Board of Awards, a "wilful act" was a positive, intentional act, and not neglect in any of its degrees. Under the interpretation of the law by Judge Day, "wilful act" has a much broader meaning. The court held that any act that is done with reckless disregard of consequences to another is a "wilful act," and that an employer is not exempt from suit for damages should an employee be injured because of the gross carelessness or neglect of an employer or his agent. According to the court's ruling the question whether an employer has shown negligence to such a degree as to constitute a "wilful act" would be left to the jury to decide in case of action for damages.

The definition of "wilful act" given by Judge Day is of great interest throughout the country, since a number of States have recently adopted workmen's compensation laws, and similar laws will be placed on the statute books of other States. The above construction was given by the court in its charge to a jury in a personal injury suit brought by the employee of an Ohio corporation, which paid into the State insurance fund under the law on the Ohio statute books last year. This in its main features was similar to the present law except that it left the employer free to choose whether or not he should pay into the State insurance fund and thus secure protection under the law. In the case on trial, the plaintiff was not an American citizen and took advantage of his right to bring his action in the Federal court instead of the State court. He claimed that his injury was due both to the wilful act of the defendant company and the fact that the lawful requirements for the protection of employees were not complied with.

REMEDYING THE OHIO LAW

While the term "wilful act" has not been passed on by State courts in Ohio, the ruling is said to be in accordance with other federal court decisions, and employers are striving to have the defect in the law removed rather than to wait for the Ohio Supreme Court to pass on the matter. Since the federal court decision, various meetings of employers' associations in the State have been held to formulate plans to secure the protection evidently intended by the law. The proposals include the elimination of the clause giving an employee the option of bringing suit, should his injury result from the "wilful act" of an employer, and the limiting of the amount of judgment that an employee can secure should he bring suit, to possibly 50 per cent. more than he would receive from the State insurance fund for similar injury. The Ohio legislature will meet in special session this week to consider other matters and the defect in the law can be remedied by legislative act should the Governor be prevailed upon to issue another formal call for the legislature to take up that subject. However, representatives of various associations of employers had a conference with Governor Cox a few days ago, and he seems disposed not to favor any changes in the law at present, but to wait until it has been in operation for a time so that the legislature in making amendments can profit by experience under the law as it now stands.

Ohio employers are now not only in the unpleasant position of being compelled to pay to the State insurance fund without being exempt from damage suits, but are not permitted under the law to reinsure in liability companies to cover damage judgments. To protect employers against these judgments, the voluntary employers' personal injury fund referred to above is being established. Each employer who joins in the movement will be asked to contribute a certain percentage of the premium fixed by the State to be paid by the employer to the State insurance fund. The percentage has not yet been decided upon, but will probably be fixed at the start at 10 to 25.

NAVAL APPROPRIATION BILL

Super-Dreadnought May Be Built and Ordnance Construction Increased

WASHINGTON, D. C., January 21, 1914.—Manufacturers of big gun forgings, shipbuilders and other branches of the iron and steel industry are manifesting a lively interest in the prospect for a considerable expansion of the naval establishment, inasmuch as Congress is about to take up the framing of the annual naval appropriation bill. Every year this bill arouses controversies between naval experts, and a struggle between the Administration and Congress, the former endeavoring to secure such additions to the navy as will at least maintain its status, if not increase its strength, and the latter seeking to limit military expenditures to a minimum. The building programme recommended to Congress by Secretary Daniels calls for 2 dreadnoughts, 8 destroyers, and 3 submarines. The authorization of these 13 vessels, in the secretary's opinion, would give the country "a well propor-

tioned" navy and represents what he styles "a middle course of wisdom."

PLANS FOR SUPER-DREADNOUGHT.

In view of the conservative tone of the department's recommendations, it is interesting to note that the designers of the navy have prepared plans for a battleship larger than any now being constructed for any navy in the world. This enormous vessel, some 6500 tons larger than any of the so-called dreadnoughts, will be 750 ft. in length, 100 ft. in breadth, with a draft of 28.6 ft. and a displacement of 38,600 tons; with an armament of 12 14-in. and 21 6-in. guns. These will be protected by 17 in. of belt armor and 16 in. of barbette armor, and the total cost of the vessel will approximate $20,000,000. A vessel of this size would not exceed the capacity of the Panama Canal, which will permit the passage of a vessel 1000 ft. in length with a beam of 110 ft. It would be easily the most powerful warship afloat and would have a speed and radius of action that would make it a most formidable addition to the navy.

The Navy Department has sought to keep secret the fact that these plans have been prepared, but there is excellent ground for the belief that the naval committees of the two houses will be asked to choose between an appropriation for two dreadnoughts of the Pennsylvania class, or one super-dreadnought of the dimensions above described. Naval armaments as authorized by Congress are usually in the nature of compromises; first, between the views of the Navy Department and the House Naval Committee and later between the opinions of the House and Senate committees. The most experienced members of the House committee are disposed to favor a liberal naval programme, but there are other members who feel that the country at large will not approve large naval expenditures in connection with the general policy of economy and of revenue reduction. Certain members of both committees who favor liberal naval expenditures would accept one super-dreadnought as an easy solution of the problem.

OUTPUT OF ORDNANCE INADEQUATE

The certainty that whether one or two battleships are authorized at the present session the Navy Department and Congress will go on with the construction of a reasonable number of warships every year gives point to a report which has been made by a special naval board and forwarded to the Senate Naval Committee by Secretary Daniels, urging the immediate increase in the size and facilities of the naval gun factory at Washington. This proposition should not be confounded in any way with Secretary Daniels's plan to establish a government armor factory.

At the present time the forgings for the big guns used on battleships and the largest cruisers are supplied by private concerns, the Bethlehem Steel Company and the Midvale Steel Company now holding these contracts. Smaller forgings are purchased under contract from the Crucible Steel Company and at various times the Government has bought forgings from other manufacturers. The manufacture of guns from these forgings has progressed at the Washington gun factory to such an extent that a thoroughly up-to-date plant has been accumulated, together with an organization capable of turning out a very high-class product. The expansion of the navy in recent years, however, has taxed the facilities of this plant until today it is hardly adequate to supplying the current requirements of the navy, to say nothing of accumulating a reserve of guns, which would be promptly drawn upon in case of war.

Regarding the present condition of the factory, the board says that "viewed from a military standpoint, the limited possible output of the gun factory is a matter of grave concern, and it strongly recommends that a commission of ordnance experts be appointed to outline some definite policy covering the extent and character of gun construction that would meet the nation's future demands, including the reserve of armament to be maintained."

PRIVATE PLANTS NEED ASSURANCES

The present reserve of heavy ordnance possessed by the navy is so small that it constitutes a distinct limitation to the operations of the fleet and the board, therefore, declares it to be "urgent that the industrial facilities for the manufacture of heavy naval ordnance should be increased in either national or commercial plants; unless the commercial plants can either be assured of continuous work, or at least of a reasonable profit on the capital invested in their armament factories, it cannot be expected that they will make extensive additions to their plants for ordnance manufacture."

The board's report serves to emphasize strongly the effect upon private manufacturers of the Navy Department's campaign to extend the Government production of material and especially to secure the establishment of an armor-plate factory. The few concerns with facilities for turning out armor plate, heavy gun forgings, etc., are naturally adopting a very conservative policy with respect to those parts of their plants engaged in this work and the naval experts who are concerned chiefly with practical results are beginning to be alarmed lest the facilities of these private establishments should prove inadequate if suddenly called upon for a material increase in output.

STATUS OF FEDERAL ARMOR PLANT PROJECT

The government armor-plate project has aroused no enthusiasm in Congress. The sole result thus far apparent is an effort on the part of a few congressmen to draw attention to the desirability of certain sites in their respective districts by the introduction of bills authorizing a plant to be constructed at a certain specified place. The idea of a government armor plant is an old one and was pushed with considerable energy by Secretary of the Navy Herbert nearly a score of years ago. A special board then appointed made an elaborate report on the subject which was transmitted to Congress, but the magnitude of the undertaking, the probable costliness of the project, the serious technical difficulties in the way, and, finally, the necessity for keeping such a plant constantly employed in order to maintain either efficiency or low cost of output resulted in the death of the project.

The present Administration and Congress are more favorably disposed toward paternalistic schemes than was the Congress that rejected Secretary Herbert's plan, but it is exceedingly doubtful if the latter will assume the responsibility for authorizing the construction of a government armor factory in the near future. W. L. C.

An increase in the manganese ore industry of India is shown by the exports for the seven months of 1913 ending with October, the total being 411,134 tons as against 318,259 tons for the same period in 1912, or an increase of nearly 100,000 tons. The greater part of this was taken by the United Kingdom. Shipments to Germany and Belgium also increased, while those to the United States fell off.

Unemployment at Iron and Steel Works

Blast Furnace Curtailment Less Than Claimed—Statements of Various Iron and Steel Companies as to Idle Men

In the past week the New York Times set out to secure direct testimony from iron and steel manufacturers as to the correctness of the statements made on the floor of the House of Representatives at Washington on Tuesday, January 13, by Representative Humphrey, and previously printed in the Daily Iron Trade, concerning the idleness of various blast furnaces. Replies were received from 28 companies, representing 47 blast furnaces out of the 123 which Representative Humphrey said had been blown out between March 1, 1913, and January 1, 1914, and were still out. These 28 companies confirm the statements made as to the idleness of their furnaces.

Further reference to the matter was made by Mr. Humphrey in the House on Thursday, January 15, and following this came some newspaper comment, pointing out that conditions in iron and steel had improved since January 1, and that therefore the Humphrey figures were not to be taken as correctly representing the status in the second week of January.

EXAGGERATION IN THE FIGURES

Attention was called last week by *The Iron Age* to the misleading character of the original figures and the fact was cited that more than three score furnaces had blown in in the ten months between March 1 and January 1, some of which had previously blown out in the same period, also to the fact that at a number of furnaces which were banked over the holidays the blast had been turned on since the opening of the new year. Representative Humphrey was naturally ignorant of the fact that changes from the active list to the idle list of blast furnaces are constantly being made and vice versa. A number of furnaces that were idle on March 1 were blown in between that date and January 1. All of such furnaces that were in blast on January 1, 1914, should have been counted as a partial offset to the 123, but none were so counted. For example, one Eliza furnace of the Jones & Laughlin Steel Company was in blast January 1, but was idle on March 1. The same is true of one furnace of the Cleveland Furnace Company at Cleveland, of one Crozer furnace in Virginia, and of the Lawrence and Star furnaces in the Hanging Rock district of Ohio; also of one Oxmoor furnace of the Tennessee Coal, Iron & Railroad Company. The American Steel & Wire Company's Central plant at Cleveland was reported to have one furnace idle January 1. The same plant had one furnace idle March 1, so that the status was unchanged. One new furnace of the Pittsburgh Steel Company which was blown in in August should have been counted as an offset to about 180,000 tons a year of idle capacity.

The most seriously misleading feature of the exhibit was the inclusion of fully twenty modern furnaces of steel companies—furnaces which were known to be banked over the holidays and which had either resumed before the day of Representative Humphrey's statement, or were expected to resume within a few days. These furnaces, as was well known in the iron trade, were banked to prevent an accumulation of pig iron through the holidays and were not "blown out" as Representative Humphrey stated.

STEEL CORPORATION CURTAILMENT

The New York Times secured no confirmation of the Humphrey figures relating to the United States Steel Corporation. The corporation's subsidiary companies were reported in the statement to have blown out 44 furnaces between March 1 and January 1, and all these furnaces, it was claimed, were still out of blast on January 13. It should be stated that of these 44 furnaces fully half were banked on January 1, so as to be ready to resume on a day's notice, and more than half of those banked were actually in blast when the Humphrey speech was made. At McKeesport and Braddock, Pa., Youngstown and Lorain, Ohio, and South Chicago, Ill., 12 Steel Corporation furnaces with a capacity of 2,000,000 tons a year were thus blown in and all should have been deducted from the statement.

Below are given extracts from the statements of manufacturers made in response to inquiries by the New York Times as to the number of men laid off since March 1, 1913, the number re-employed and the prospects for 1914. It will be evident that the "million idle men" estimate is a gross exaggeration. The Steel Corporation's net reduction in men employed, it will be seen, is only 30,000.

LACKAWANNA STEEL COMPANY

E. A. S. Clarke, president Lackawanna Steel Company:

As of March 1, 1913, our records show that there were 9190 men on the payroll, and as of December 27, 1913, there were 4888 men on our payroll. For the week ending January 10, 1914, the records show 5220 men on the payroll, the difference being due to temporary re-employment on account of a small accumulation of orders which had to be filled. I am unable to give any estimate of the additional number of men who may be employed during 1914. In my judgment it depends very largely on the prosperity of the railroads. If the railroads are not prosperous the number of men may be further reduced instead of being increased.

REPUBLIC IRON & STEEL COMPANY

Chairman John A. Topping, of the Republic Iron & Steel Company, reported that most departments were working about 50 per cent., and added:

So far as the operations of the Republic Iron & Steel Company are concerned, we have been on a gradually shrinking scale since August. At the present time we have five blast furnaces idle out of a total of ten stacks. Our ore and coal mines, steel works and rolling mills, and various other factories, are working on approximately a 50 per cent. basis of capacity. Our payroll is, naturally, affected by the reduced volume of business, but our policy has been to divide the work among our men as best we could, with a view to maintaining our organization and minimizing the hardships of idleness. Here is the number of men employed in the last five months, as indicated by our payroll:

August	10,438 men
September	10,035 men
October	9,182 men
November	8,108 men
December	6,434 men

From which it will be observed that we have, at the present, discharged approximately 4000 men on ac-

count of lack of employment. The immediate outlook for an increased volume of business, and better working time for labor, is more encouraging, although wage rates are on a declining scale. I am rather hopeful for the future, because conditions abroad are slowly improving and improvement there should be reflected here quickly.

EASTERN PENNSYLVANIA COMPANIES

The receivers of the Central Iron & Steel Company, Harrisburg, Pa., said:

We blew out one stack December 31, 1913, and have laid off approximately 200 men since March 1, 1913. We have re-employed none. The immediate prospects of employing more men during the current year are not very bright. This feature may change should the iron and steel trade pick up. Our reason for blowing out the furnace was due to the remarkably low prices obtainable in the demoralized pig iron situation.

The Pennsylvania Steel Company telegraphed from Steelton, Pa.:

Four out of seven stacks were blown out since March 1, 1913. Net number of men discharged since March, 2000; others on reduced time. We are keeping many men busy on remodeling portions of plant that would otherwise be laid off. The number of men has declined steadily. We expect to put on more men as quickly as we receive new orders, of which we will get our share. Present acute stagnation cannot continue long.

The Thomas Iron Company, Easton, Pa.:

We have blown out one Hokendauqua, one Hellertown and one Alburtis furnace since March 1, 1913, and have blown in one Alburtis furnace since March 1, 1913. We have laid off 154 men since then and have not re-employed any of them. We will re-employ 100 men as soon as market conditions warrant. Prospects look more favorable.

Eastern Steel Company, Pottstown, Pa.:

Since March 1 one furnace has been blown out, repaired, and not blown in. On account of insufficient business we have laid off about 135 men; none re-employed. We are unwilling to prophesy as to prospects.

Empire Steel & Iron Company, Catasauqua, Pa.:

On March 1, 1913, we were operating five furnace stacks. On January 1, 1914, we were operating one stack. To-day we have two stacks in blast. On March 1, 1913, 1150 men were employed. On January 14, 1914, 916 men were employed. Neither the amount of business in sight nor the prices obtainable are such as to justify any increase in the present number of men employed. The present wage schedule, in effect since January, 1913, is the highest in the history of the industry in this section.

VARIOUS STEEL COMPANIES

Cambria Steel Company, Johnstown, Pa.:

We now have two idle stacks out of eight furnaces that were in blast in March. The present total force is practically the same as in March. The earnings of the men are 10 per cent. less on account of reduced time and tonnage. The force has been practically constant since March. Present indications are that a less number of men will be employed during this year, but we hope for improvement in business. The Cambria has operated more fully recently than orders warranted in order to keep our men employed. This has been accomplished by making improvements and repairs and by stocking metal billets and other products.

Jones & Laughlin Steel Company, Pittsburgh:

We have four idle blast furnaces. We have laid off about 30 per cent. of our men since March 1, 1913. As yet we have re-employed none. We hope conditions will permit us to employ more men during 1914.

Maryland Steel Company, Sparrows Point, Md.:

One blast furnace has been blown out and two furnaces banked since December 15, 1913. The blast furnaces and steel works are completely shut down for the first time in 17 years. The reason is the want of orders for steel rails. We intend to resume just as soon as we can secure orders for sufficient tonnage. About 1500 men are laid off until then. The prospect is indefinite and not encouraging.

Colorado Fuel & Iron Company, Pueblo, Col.:

On account of the strike of Colorado miners and some reduction in the demand for steel, our operating blast furnaces were reduced from three to one, and about one-half of our employees, or 2000 men, were temporarily laid off. Conditions have improved. We have about 2500 men working, are blowing in another blast furnace, and there is a fair prospect of a still further increase in the working force.

Brier Hill Steel Company, Youngstown, Ohio:

One furnace has been closed since last March, and the number of men employed reduced about 25 per cent. We have not reduced wages, and expect to have 100 per cent. of men employed by April 1.

Inland Steel Company, Chicago, Ill.:

We had one stack out for repairs, but it is in blast again. We laid off about 1000 men, some of whom were on new work, which is completed. Our regular operating departments are running about 75 per cent. of capacity. If railroad buying should be resumed, we think full employment could be given through 1914.

UNITED STATES STEEL CORPORATION

The Times of January 16 had the following:

It was learned in authoritative quarters yesterday that the United States Steel Corporation had re-employed since the first of the year about 10,000 men who had previously been laid off. The men were a part of the force discharged in the severe depression of December. The corporation's payroll last June, when the mills and furnaces were working at a high rate of capacity, contained the names of 195,000 workers in round numbers. As incoming orders declined a gradual cutting down of the working force occurred, although the heaviest contraction did not come until November. By Christmas the number of employees had been reduced to 155,000 and the addition of 10,000 after January 1 brought the roster up to 165,000 men, the number employed at the present time.

Book Review

Heaton's Annual—Commercial Handbook of Canada. Published by Heaton's Agency, Toronto. Price, $1.

This issue is the tenth edition. The first edition was compiled in 1904 for the Department of Commerce of the Dominion Government, to meet the requirements of British firms doing business with Canada. Year by year, the book has been gradually developed with special regard to its original purpose, and to meet the requirements of those who want a book of easy reference to answer questions regarding the Dominion. It is now regarded as almost indispensable to any financial or commercial firm having business relations with Canada. No pains have been spared to maintain the reputation of the book as the standard authority on customs tariff. The digest of the customs laws and regulations includes all the memoranda and bulletins that are issued to customs officials. The portion known as "Shipper's Guide" gives the population, banking accommodation and railroad connections in every banking town in the Dominion. Miscellaneous information covers descriptions of towns in Canada of any commercial importance, including existing industries and special opportunities for new industries, mining, railroads, game laws, water powers, etc.

The Carbon Steel Company, Pittsburgh, for the past four years has been successfully making high-grade nickel, chrome-nickel and chrome-vanadium steel. To meet the constantly increasing demand for its special brands it is installing electrically-driven bar mills, which are expected to be in operation very early in February.

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Why Make Bad Conditions Worse?

The business men of the country may well say to those at Washington and elsewhere who are using industrial conditions as pawns in their game of politics, "A plague on both your houses." There may be some palliation for the optimists, even when their claims and predictions are not borne out (as was seen in the sunshine movement of 1908 and 1909), for they are the discoverers of the silver lining on all financial and industrial clouds. But what is to be said of those who seek partisan advantage by painting in the darkest colors conditions in trade and industry? The exaggerated "million-idlemen" exhibit for the iron and steel and allied industries, enlarged on and gloated over in the House of Representatives at Washington last week, was a spectacle of partisanship on the lowest plane to which it ordinarily descends.

The facts about conditions in the iron and steel trades have been and are bad enough; but there can be no justification for statements which make out a situation worse than the actual. We are not left in doubt as to one immediate objective of the Humphrey exaggeration. The man himself says that the publication "came at a most opportune time, as the President is to deliver his anti-trust message next Tuesday." We are not here discussing the bearing of the steel trade depression upon the Government's attitude toward the trusts. The thing about this whole performance and its staging that needs to be brought out so clearly that neither the performance nor the performers will be forgotten is that their sensation was sprung just as the iron and steel trades were attempting to lift their heads from what, in the minds of many, was the lowest depth of the depression. The time may have been "opportune," as Mr. Humphrey says, from the standpoint of partisan advantage, but highly inopportune from that of the vast interests that have been looking anxiously for any signs of promise in industry.

It is most deplorable that a situation has been created in which one set of public men—and apparently some men in industry are helping them along—will now seek to marshal and even distort every unfavorable fact about business, so that sentiment may be created for or against certain political measures and movements. It matters not that many public men who are now eager to find signs of returning prosperity have been in other times arrayed on the side of calamity. The country will get nowhere on such miserable bickering. What is needed is more willingness than now appears, to put the welfare of the people, in their homes and in their work, above any desire to rout a political opponent, or to embarrass those charged for the time being with the responsibilities of government. Whatever dissent there may be from the policies of the present national administration, there is neither good morals nor patriotism in misleading reports about industry, which intensify unfavorable conditions and chill the all too tender plant of confidence.

Consumption of Coated Steel Sheets

British export statistics make the same showing as has been made by the production statistics of the United States, evidencing a large increase in recent years in the consumption of galvanized sheets and tin plates. In the United States the production of steel sheets more than doubled in seven years, and while there are no separate statistics of the output of galvanized sheets there is no question that the consumption of such sheets at least kept pace with the growth in consumption of black sheets.

British exports of galvanized sheets in 1913 amounted to 762,244 gross tons, representing a gain of more than 100,000 tons over the best previous year and an increase of 88 per cent. in eight years. Before considering details it is well to set down the actual statistics:

British Exports of Galvanized Sheets and Tin Plates. Gross Tons, Calendar Years.

	Galv. sheets.	Tin plates.
1905	406,815	354,864
1906	443,131	375,414
1907	467,889	405,328
1908	390,281	403,007
1909	491,873	439,747
1910	596,949	482,981
1911	617,557	484,355
1912	658,650	481,123
1913	762,244	494,921

British exports of black sheets are relatively small, having been in 1913 less than one-tenth the exports of the galvanized product. For this great disparity there is a special reason, which is that black sheets will not stand the ocean voyage as well as the coated product.

The increase in British exports of tin plates is not nearly as great as the increase in galvanized sheet exports, being in eight years only 40 per cent., as against 88 per cent. for galvanized sheets; but this comparison does not necessarily indicate a correspondingly slower growth of tin plate consumption, on account of the part the United States has

played in tin plate. Outside of the few producing countries, British exports of galvanized sheets represent the great bulk of the world's consumption, since other countries export but little of this product. The time was, but a very few years ago, that the United States imported a great deal of tin plate from Great Britain (subject to drawback of duty upon the export of manufactured goods) and exported very little, whereas now the conditions are reversed, the tin plate exports greatly preponderating. In 1905 the American tin plate imports exceeded the exports by 43,000 tons, whereas in 1913 the exports showed an excess of about 58,000 tons. Thus we have a reversal of 100,000 tons in the eight years. The British export statistics show an increase in the eight years from 354,864 tons to 494,921 tons, or 140,000 tons, but the reversal of 100,000 tons in the American statistics shows that the increase in tin plate exports from the two countries to other countries gained 240,000 tons in the eight years, a very substantial increase indeed.

Not in recent years has the United States imported galvanized sheets from Great Britain, so no allowance need be made on this head, but lately the United States has become an important exporter of galvanized sheets, the 1913 exports being about 70,000 tons. This business has been added in recent years, well within the period in which British exports of galvanized sheets increased from 406,815 tons in 1905 to 762,244 tons in 1913.

Thus our entrance into the export market with galvanized sheets can hardly be regarded as at the expense of Great Britain, seeing the great expansion which that country's trade has experienced. Rather that expansion shows why it has been possible for us to acquire this export trade, when our wage cost is so much higher than that of the British manufacturers. As a matter of fact, very little is known as to the relative costs of manufacturing sheets in the United States and in England. It is well known that there is a great disparity in the wage scales, and this is an absolute difference, not modified by differences in tonnage output, for the reason that the rates for skilled labor are paid by the ton. These statistics may therefore help to throw light upon the question which has lately been raised, why it is that British prices of sheets are somewhat higher than our own. It is claimed that the American sheet mills are actually losing money at the present time, making proper allowances for depreciation and overhead, while it seems quite probable that the British mills are enjoying a very comfortable margin of profit.

Hasten the Rate Decision

The accumulation of sentiment favorable to an increase in freight rates, in response to the petition of the railroads east of the Mississippi, must come first in any recital of indications of better business. The steel trade is in a position where such action would go far toward determining the sort of year it is to have. We cannot recall a time when the minds of men in all branches of the industry so converged upon one thing as needful to better business. The worst feature of the situation is the delay in deciding the case. Elsewhere our Washington correspondent gives the reasons for this, from the standpoint of the Interstate Commerce Commission. Considering how long the matter has been discussed as a definite proposal, the slow pace of the procedure thus far indicates that at the beginning there was much less idea of granting an advance than is evident now.

The pains taken in inspired Washington dispatches of the past week to tell of the President's desire to have proper "consideration" shown the railroads in the plight in which they find themselves is highly significant. There are from other high sources definite indications, such as have not appeared before, that a favorable decision by the Interstate Commerce Commission would not be displeasing to administration leaders. While sentiment outside has been coming rapidly to the point of discounting some advance, even though it be not the full 5 per cent asked, it is quite evident that the railroads will require the actual granting of a higher rate before relaxing appreciably from their present buying policy. It is therefore highly important that whatever the Interstate Commerce Commission does it should do quickly.

Organizing the Scrap-Iron Trade

The efforts of scrap-iron dealers in Chicago, Cleveland, Buffalo, Pittsburgh, and other important scrap-consuming centers to form associations for the purpose, as the organizers say, "to correct some abuses that have existed in the scrap trade for years," will be watched with much interest. The opinion properly prevails that if the proposed associations are founded on the right lines and for legitimate purposes only, they will be of benefit to both dealers and consumers. It is pointed out that associations of dealers handling other classes of waste material which were organized some time ago have been successful and have brought about some needed reforms in such trades.

One of the objects aimed at by the proposed Pittsburgh association is the correction of a practice which appears to have grown quite common in recent years. This is the assumption by a consumer of the right to reject, without recourse, any material which does not come rigidly within his specifications. It is proposed that the association shall appoint a committee to have jurisdiction in the case of a consumer rejecting shipments of scrap. The method suggested is that when a dealer is notified that a shipment has been rejected because of inferior quality, or for any other cause, he will communicate with the committee, giving the facts in the case. The committee will then make a personal inspection of the scrap, and if its decision is that the shipment is up to the standard called for in the contract an effort will be made to compel the consumer to accept it.

The past year has been conspicuously productive of flagrant cases of arbitrary rejection of old material by large steel companies and by operators of iron rolling mills. This practice grew with rapidity as the price of scrap declined. In the latter part of 1912 and in the early months of 1913, heavy sales were made by scrap dealers for future delivery at good prices, but much difficulty was encountered in

the endeavor to fill these contracts. It was claimed by dealers that rejections were made for the most trivial reasons and that much scrap was then refused which, under other market conditions, would have been accepted without protest. Color is given to the claim that these rejections were due to the decline in scrap prices by the fact that, after a rejection, an offer would be made by the same consumer to take in the objectionable material at a considerably lower price.

It is asserted by large dealers that they are not always able to control the exact contents of a car loaded with old material. They purchase from railroad lists and rely upon the representatives of the railroads to furnish precisely what they bought, but occasionally, through mistake or otherwise, a carload of old material may have a few pieces of some different kind of scrap. This is seized upon as a pretext for rejecting the entire car. It would seem to be an easy matter, if the consumer felt so disposed, to throw aside the offending pieces, on which a special price could then be made. The dealer, however, is heavily penalized for the blunder or fault of the railroad.

At some time in the past, the dealer in scrap may have been an irresponsible person, full of sharp practices and guilty of endeavoring to palm off inferior material. Possibly such individuals may have brought the trade into disrepute, for which it is now suffering. In recent years, however, dealers in scrap have grown to be as important, and have shown themselves as honorable, as those engaged in any other branch of the iron trade, and they are entitled to as full a share of courteous treatment as other business interests. If the dealers, by organizing, can secure for themselves a better standing in this respect and the enforcement of a square deal in periods of declining prices, they will accomplish a much needed reform.

United States Tin Output in 1913

A small output amounting to an equivalent of about 50 net tons of metallic tin was made from five localities during 1913, according to information received by Frank L. Hess of the United States Geological Survey. Three of the producing localities are in Alaska and one each in South Dakota and South Carolina.

In Alaska the York Dredging Company, working on Buck Creek about 15 miles east of Cape Prince of Wales, produced 65 tons of stream tin carrying approximately 68 per cent. of tin. Thirty-five tons of stream tin produced in 1912 and left on the beach at York was also shipped during 1913. On Lost River, 20 miles south of Buck Creek, the Jamme Syndicate put up an experimental concentrating plant, in which 49 tons of ore gave 5000 lb. of concentrates carrying 62.5 per cent. of tin and 11.1 per cent. of tungsten. The company is said to have developed a considerable quantity of similar ore and to have larger plans for future work. It is reported that on Sullivan Creek, near Hot Springs, on the south side of lower Tanana River, about 2 tons of stream tin was taken out.

A little more than a ton of concentrates was shipped from the vicinity of Tinton, S. D. The Cherokee Tin Mining Company took 5700 lb. of cassiterite out of residual placers at Gaffney, S. C.; the product carried 71.5 per cent. of tin. The company did some prospecting by drilling and expects to work the lode. In North Carolina the Piedmont Tin Mining Company did some development and prospecting work at Lincolnton, but made no production.

Western Scrap Dealers' Association

At a meeting held at the Hotel La Salle, Chicago, January 13, the Western Scrap Iron & Steel Association was organized, with a membership embracing brokers and dealers in scrap iron and steel from practically every large city in the West. D. R. Cohen, D. R. & F. A. Cohen, Chicago, who was elected president, states that the new association was formed to foster a frank and friendly intercourse among its members and to promote the interests of the firms engaged in the scrap iron and steel business.

The other officers elected were the following: D. L. Verner, Chicago, secretary; R. T. Rolfe, Chicago, treasurer; J. L. Lieberman, Chicago, first vice-president; Sam Lanski, Chicago, second vice-president; Hyman Cohen, St. Louis, third vice-president; Louis Paper, St. Paul, fourth vice-president; A. Weber, Louisville, fifth vice-president; L. I. Bregman, Chicago, sixth vice-president; Carl Briggs, Chicago, seventh vice-president. Directors, R. T. Rolfe, Chicago; J. Singer, Chicago; M. L. Fox, Racine, Wis.; L. J. Borinstein, Indianapolis; B. Colitz, Chicago; Herman Sonken, Kansas City, Mo.; Abe Feinberg, Muncie, Ind.; Fred Mayer, Chicago.

At a special meeting of the executive board, consisting of the officers and directors, a constitution and by-laws will be prepared for presentation at the next meeting of the association which will be held February 10, at the Hotel La Salle.

Officers have been chosen by the New York Central Iron Works Company, Hagerstown, Md., recently incorporated with $225,000 capital stock to take over the business of the bankrupt New York Central Iron Works. M. P. Moller, president Crawford Automobile Company, Hagerstown, is the new president; L. D. Perry, comptroller Central Iron & Steel Company, Harrisburg, Pa., vice-president, and C. E. Whipple, for the past seven years chief draftsman of the mechanical division in charge of the planning department of the Panama Canal, is general manager. The works were started in 1853 at Geneva, N. Y., moved to Hagerstown in 1911, enlarged in 1912, and are thoroughly equipped for steel plate fabrication. The main building is 80 x 500 ft., of concrete and steel. The principal product will be the Dunning house heating boiler, which is of steel plate construction and has been manufactured for 60 years. The company also owns real estate and buildings at Geneva, N. Y., and is planning to develop this property.

The Detroit Steel Products Company, Detroit, Mich., held its annual convention and sales meeting January 12 to 17, inclusive, in that city. Employees from eight branch offices and 40 distributing points were in attendance. The business of the past year was gone over and plans for 1914 were mapped out. Several lectures on methods of manufacture and sales and advertising policies were given and social features were enjoyed every evening. The company's officials state that business already secured indicates a very prosperous year.

The director of the United States Mint estimates the world's production of gold in 1913 at $463,312,673, which is a decrease of $2,834,000 compared with 1912. The production in the United States was $88,301,000, a decrease of $5,150,000 from 1912.

November Iron and Steel Exports and Imports

While the November report of the Bureau of Foreign and Domestic Commerce shows a decrease in the value of both the iron and steel exports and imports, if the figures are reduced to a daily basis it will be found that the country imported on the average $106 more per day than it did in October, the figures for the two periods being $83,170 and $83,064 per day respectively. On the other hand, the daily average value of the exports declined from $812,572 in October to $671,405 in November. The value of the exports in November decreased 20 per cent. from the figures for October, which were 15 per cent. more than September. The imports in November, a 30-day month, were only 3 per cent. less than in October, a 31-day month. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, in November was $20,142,141, against $25,189,745 in October, $22,831,082 in September and $26,406,425 in November, 1912. Import values for November were $2,495,093 as compared with $2,574,978 in October, $2,428,841 in September and $2,793,448 in November, 1912.

The total value of the exports of iron and steel and manufactures thereof, not including iron ore, for the 11 months ended with November was $271,818,359, against $265,377,556 for the corresponding period of 1912. The value of the imports of iron and steel and manufactures thereof, excluding iron ore, for the 11 months ended with November, was $30,786,448, as compared with $26,679,224 for the corresponding period of 1912.

The exports of commodities for which quantities are given totaled 175,514 gross tons in November, as compared with 220,493 tons in October, 213,055 tons in September and 232,896 tons in November, 1912. Among the changes attention should be called to the increase in bar iron from 884 tons in October and 1472 tons in November, 1912, to 2508 tons and the decrease in wire rods from 5692 tons in November, 1912, and 3150 tons in October, 1913, to 1032 tons.

Details of the exports of tonnage commodities in November and the 11 months ended with November, compared with the corresponding periods of the previous year, are as follows:

Exports of Iron and Steel

	November		Eleven months	
	1913.	1912.	1913.	1912.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	18,293	25,278	252,148	248,665
Scrap	11,334	7,507	89,740	96,639
Bar iron	2,508	1,472	15,963	19,691
Wire rods	1,032	5,692	54,231	57,994
Steel bars	15,873	23,033	196,804	191,862
Billets, ingots and blooms, n.e.s.	1,052	18,949	89,615	272,364
*Bolts and nuts	1,469	1,575	20,852	†8,396
Hoops and bands	1,261	1,186	15,399	11,142
*Horseshoes	110	132	1,133	†408
Cut nails	250	329	3,402	8,772
*Railroad spikes	451	1,120	10,749	†5,648
Wire nails	2,682	3,345	40,664	64,038
All other nails, including tacks	278	323	3,610	7,821
Pipes and pipe fittings	18,886	20,667	280,092	231,526
Radiators and cast-iron house heating boilers	263	846	7,574	5,272
Steel rails	24,911	31,947	438,635	411,194
*Galvanized-iron sheets and plates	4,129	9,911	73,411	†59,239
All other iron sheets and plates	1,106	2,125	21,571	121,665
Steel sheets and plates	.....	.....	.....	$150,721
*Steel plates	9,274	21,243	210,942	†116,906
*Steel sheets	6,269	11,898	130,562	†54,301
Structural iron and steel	35,802	21,450	378,510	262,949
Tin and terne plates	2,455	4,208	55,377	77,155
Barbed wire	7,428	8,522	74,188	89,290
All other wire	8,398	10,138	99,378	137,976
Totals	175,514	232,896	2,564,550	2,711,634

*Not separately stated prior to July 1, 1912.
†Figures cover period since July 1, 1912.
‡Figures are for January to June, inclusive.

In November the imports of commodities for which quantities are given totaled 25,810 gross tons against 20,824 tons in October, 19,939 tons in September and 24,109 tons in November, 1912. Details of the imports of commodities for which quantities are given in November and the 11 months ended with November, compared with the corresponding periods of the previous year are as follows:

Imports of Iron and Steel

	November		Eleven months	
	1913	1912.	1913.	1912.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron (including ferrosilicon)	.....	14,318	*120,612	117,263
Ferrosilicon	318	.....	†624	.....
All other pig iron	13,443	.....	†22,750	.....
Scrap	2,754	3,668	42,841	20,900
Bar iron	2,302	2,234	23,506	26,914
Structural iron and steel	465	364	10,618	2,866
Ingots, blooms and steel billets	.....	1,570	*17,765	17,006
Steel billets without alloys	857	.....	†1,631	.....
All other steel billets	2,452	.....	†4,470	.....
Steel rails	1,621	513	8,766	3,585
Sheets and plates	117	239	2,702	3,095
Tin and terne plates	202	97	15,939	1,882
Wire rods	1,279	1,106	15,158	13,738
Totals	25,810	24,109	287,382	207,249

*Figures cover period from January 1 to October 3, inclusive.
†Figures cover period since October 3, 1913.

The imports of iron ore in November were 179,727 gross tons as compared with 274,433 tons in October, 295,424 tons in September and 163,017 tons in November, 1912.

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The Iron and Metal Markets

CONTINUED IMPROVEMENT

Close to a 60 Per Cent Steel Output

Structural Outlook Better — Pig Iron Buying Heavy—Large Oil Pipe Inquiry

The change toward better sentiment has become more marked in the steel trade and there has been some increase in the volume of business. The note of conciliation in the President's message has plainly added to the better feeling.

Our Pittsburgh report gives encouragement in several particulars. There is more disposition there to say that the turn has been made, but with this comes a caution against expectations of any quick recovery. One item is that a leading steel company had a larger total of orders and specifications in the past week than in any week in eight months. Another had 10,000 tons more of orders than shipments this month up to the 19th. Steel works are now close to a 60 per cent. operation, on the average.

Business is still done at the prices with which buyers have become familiar in the recent weeks of negotiating. New concessions have not developed, nor is it expected that advances will come without the closing of good sized contracts for forward delivery, which thus far have been quite generally staved off.

Some brightening in the structural trade is indicated, business just closed in Eastern territory amounting to 40,000 tons, of which only half was subway work. Cleveland reports 10,000 tons of pending fabricating contracts and a decided improvement in the outlook.

Plate and wrought pipe manufacturers have been electrified by the appearance of the largest inquiry the leading oil interest has sent out at one time. Purchases may run quite above 300,000 tons, nearly two-thirds being pipe, while the plates making up the remainder will be converted into pipe under contract, as in other years. The Philadelphia Company's inquiry includes 27 miles of 16-in., 10 miles of 10-in. and 20 miles of smaller pipe. There is also pending 30 miles of 8-in. pipe for the Pacific coast. One large pipe company is now operating at 75 per cent. of capacity, as against an average of 60 per cent. last month.

The Chicago & Northwestern has given out 35,000 tons of rails for 1914 delivery besides releasing a considerable amount on which shipments were held up last year. It has also placed several thousand tons of bridges. The Southern Railway rail order to the Tennessee Company amounted to 20,000 tons.

Sheet bar contracts closed in the Central West for the first quarter have been quite heavy. The Carnegie Steel Company is no longer a seller of semi-finished steel for that delivery. Bessemer sheet bars have sold as high as $21 at mill, or $1 a ton above the recent basis for open hearth steel.

A sale of 1000 tons of German basic Bessemer billets, 4 x 4 in., has just been made for shipment to this country at something over $21 at the Eastern seaboard. Some importations of small German billets are also being arranged.

In Western foundry pig iron markets buying has gone on at a good rate, at prices still attractively low. Stove manufacturers have taken some round lots. In the Chicago district No. 2 foundry and malleable Bessemer have sold at $13.50 at furnace, prices there being more irregular as the selling has broadened. St. Louis reports sales of 30,000 tons, with a large tonnage pending, including in one case 20,000 tons and in another 10,000 tons of basic iron.

Some Tennessee warrant iron has been thrown upon the market at a price which some Alabama sellers have met, at $10.50, Birmingham, for No. 2 foundry. Even at that figure Southern iron is still crowded out from important Central Western points by the low prices of Northern furnaces. At the same time good-sized sales of Southern basic have been made, and Alabama furnaces got 90,000 tons of the recent pipe foundry puhchases.

Several Lake Superior iron mines have closed down, owing to the prospect for a considerable reduction in ore shipments this year, and curtailment at other mines is expected.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month, and one year previous.

	Jan. 21, 1914.	Jan. 14, 1914.	Dec. 24, 1913.	Jan. 22, 1913.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	$14.50	$14.50	$15.00	$18.50
No. 2 Valley furnace...	12.75	12.75	13.00	17.50
No. 2 Southern, Cin'ti...	*13.75*	14.00	13.75	16.75
No. 2, Birmingham, Ala.	*10.50*	10.75	10.50	13.50
No. 2, furnace, Chicago*	*13.50*	14.00	14.00	18.00
Basic, del'd, eastern Pa..	14.00	14.00	14.25	18.00
Basic, Valley furnace....	12.50	12.50	12.75	16.35
Bessemer, Pittsburgh ...	14.90	14.90	15.90	18.15
Malleable Bess., Ch'go*.	*13.50*	14.00	14.50	18.00
Gray forge, Pittsburgh..	*13.40*	13.65	13.90	17.15
L. S. charcoal, Chicago..	15.25	15.25	15.25	18.00
Billets, etc., Per Gross Ton:				
Bess. billets, Pittsburgh.	20.00	20.00	20.00	28.50
O.-h. billets, Pittsburgh..	20.00	20.00	20.00	29.00
O.-h. sheet bars, P'gh....	20.00	20.00	21.00	29.50
Forging billets, P'gh....	24.00	24.00	24.00	36.00
O.-h. billets, Phila.....	21.50	21.50	22.40	32.00
Wire rods, Pittsburgh ..	25.50	25.50	25.00	30.00
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	13.00	13.00	13.00	16.75
Iron rails, Phila.....	15.50	15.50	15.50	18.00
Carwheels, Chicago	**11.75**	11.50	11.50	16.75
Carwheels, Philadelphia.	**12.50**	12.00	12.00	16.25
Heavy steel scrap, P'gh..	11.00	11.00	10.75	15.00
Heavy steel scrap, Phila.	**11.00**	10.00	10.00	14.50
Heavy steel scrap, Ch'go.	**9.50**	9.25	9.00	12.50
No. 1 cast, Pittsburgh....	10.75	10.75	12.00	14.50
No. 1 cast, Philadelphia.	12.00	12.00	12.00	15.00
No. 1 cast, Ch'go (net ton)	10.25	10.25	10.00	12.75
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	1.20	1.20	1.22½	1.77½
Iron bars, Pittsburgh....	1.35	1.35	1.35	1.70
Iron bars, Chicago.....	*1.10*	1.12½	1.10	1.57½
Steel bars, Pittsburgh...	1.20	1.20	1.20	1.70
Steel bars, New York...	1.36	1.36	1.36	1.86
Tank plates, Pittsburgh..	1.20	1.20	1.20	1.75
Tank plates, New York...	1.36	1.36	1.36	1.91
Beams, etc., Pittsburgh..	1.20	1.20	1.20	1.75
Beams, etc., New York..	1.36	1.36	1.31	1.91
Skelp, grooved steel, P'gh.	1.20	1.20	1.20	1.45
Skelp, sheared steel, P'gh.	1.30	1.30	1.30	1.50
Steel hoops, Pittsburgh..	1.35	1.35	1.35	1.60
Sheets, Nails and Wire,				
Per Lb. to Large Buyers:				
Sheets, black, No. 28, P'gh	1.85	1.85	1.90	2.35
Galv. sheets, No. 28, P'gh.	2.85	2.85	2.90	3.50
Wire nails, Pittsburgh...	1.55	1.55	1.55	1.75
Cut nails, f.o.b. East'n mills	1.65	1.65	1.65	1.75
Cut nails, Pittsburgh....	1.55	1.55	1.55	1.70
Fence wire, base, P'gh...	1.35	1.35	1.35	1.55
Barb wire, galv., P'gh...	1.95	1.95	1.95	2.15

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville,

Per Net Ton at Oven:	Jan. 21, 1914.	Jan. 14, 1914.	Dec. 24, 1913.	Jan. 22, 1913.
Furnace coke, prompt...	$1.85	$1.85	$1.75	$3.75
Furnace coke, future....	2.00	2.00	1.85	3.25
Foundry coke, prompt...	2.50	2.50	2.50	4.25
Foundry coke, future...	2.60	2.60	2.60	3.60

Metals,

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.	**14.75**	14.50	14.62½	16.37½
Electrolytic copper, N. Y.	**14.37½**	14.00	14.37½	16.12½
Spelter, St. Louis.....	5.10	5.10	5.00	6.95
Spelter, New York.....	5.25	5.25	5.15	7.10
Lead, St. Louis.....	3.97½	3.97½	3.95	4.20
Lead, New York.....	4.10	4.10	4.10	4.35
Tin, New York.....	**37.85**	36.70	36.65	50.50
Antimony, Hallett's, N. Y.	7.00	7.00	7.00	9.25
Tin plate, 100-lb. box, P'gh.	$3.25	$3.40	$3.40	$3.60

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh, in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier, 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.20c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturer's standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in....	.10
Gauges under 3-16 in. to and including No. 8....	.15
Gauges under No. 8 to and including No. 9....	.25
Gauges under No. 9 to and including No. 10....	.30
Gauges under No. 10 to and including No. 12...	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles 3 ft. in diameter and over.....	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive...	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive...	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.20c. to 1.25c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs.	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick as per steel bars card, Sept. 1, 1909.....	.70
Tees, structural sizes (except elevator, hand rail, car truck and conductor rail).....	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.....	.20 to .80
Deck beams and bulb angles.....	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft., to 2 ft., inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Rods.—Bessemer, open-hearth and chain rods, $25.50 to $26.

Wire Products.—Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers annealed, $1.35; galvanized, $1.75. Galvanized barb wire and fence staples, to jobbers, $1.95; painted, $1.55. Wire nails to jobbers, $1.55. Prices of the foregoing wire products to dealers, in carload lots, are 5c. higher. Woven wire fencing, 74½ per cent. off list for carloads; 73½ off for 1000-rod lots; 72½ off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	2.00	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe in effect from October 27, 1913, and iron pipe from June 2, 1913, all full weight:

Butt Weld

Steel. Inches.	Black.	Galv.	Iron. Inches.	Black.	Galv.
⅛, ¼ and ⅜	73	52½	⅛ and ¼	66	47
½	77	66½	⅜	65	46
¾ to 3	80	71½	½	69	56
			¾ to 2½	72	61

Lap Weld

2	77	68½	1¼	56	45
2½ to 6	79	70½	1½	67	56
7 to 12	76	65½	2	68	58
13 to 15	53	..	2½ to 4	70	61
			4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted

1 to 3, butt	78	69½	1 to 1½, butt	70	59
2, lap	75	66½	2, butt	70	59
2½ to 6, lap	77	68½	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap	68	59

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	68	57½	⅜	63	52
½	73	66½	½	67	60
¾ to 1½	77	70½	¾ to 1½	71	62
2 to 3	78	71½	2 and 2½	72	63

Lap Weld, extra strong, plain ends

2	74	65½	1½	65	59
2½ to 4	76	67½	2	66	58
4½ to 6	75	66½	2½ to 4	70	61
7 to 8	68	57½	4½ to 6	69	60
9 to 12	63	52½	7 and 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends

½	63	56½	½	57	49
¾ to 1½	66	59½	¾ to 1½	60	52
2 to 2½	68	61½	2 and 2½	62	54

Lap Weld, double extra strong, plain ends

2	64	57½	2	55	49
2½ to 4	66	59½	2½ to 4	60	54
4½ to 6	65	58½	4½ to 6	59	53
7 to 8	58	47½	7 to 8	52	42

To the large jobbing trade an additional 5 and 2½ per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads, in effect from January 2, 1914, are as follows:

Lap-Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	61	1½ in.	45
2¼ in.	58	1¾ and 2 in.	49
2½ and 2¾ in.	64	2¼ in.	45
3 and 3¼ in.	69	2½ to 2¾ in.	54
3½ and 4½ in.	71	3 and 3¼ in.	57
5 and 6 in.	64	3½ to 4½ in.	60
7 to 13 in.	61	5 and 6 in.	49

Locomotive and steamship special charcoal grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft., and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.40 to 1.45
Nos. 9 and 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.60
Nos. 13 and 14	1.55 to 1.65
Nos. 15 and 16	1.65 to 1.70

Box Annealed Sheets, Cold Rolled

Nos. 10 and 11	1.50 to 1.60
No. 12	1.50 to 1.60
Nos. 13 and 14	1.55 to 1.65
Nos. 15 and 16	1.60 to 1.70
Nos. 17 to 21	1.65 to 1.75
Nos. 22 and 24	1.70 to 1.80
Nos. 25 and 26	1.75 to 1.85
No. 27	1.80 to 1.90
No. 28	1.85 to 1.95
No. 29	1.90 to 2.00
No. 30	2.00 to 2.10

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	1.85 to 1.95
No. 12	1.95 to 2.05
Nos. 13 and 14	1.95 to 2.05
Nos. 15 and 16	2.10 to 2.20
Nos. 17 to 21	2.25 to 2.35
Nos. 22 and 24	2.40 to 2.50
Nos. 25 and 26	2.55 to 2.65
No. 27	2.70 to 2.80
No. 28	2.85 to 2.95
No. 29	3.00 to 3.10
No. 30	3.15 to 3.25

Pittsburgh

PITTSBURGH, PA., January 21, 1914.

Sentiment is more cheerful now than for some months, and in certain branches the mills are entering more orders than since early last year. One leading steel company reports that its actual orders and specifications in the two weeks ended January 17 were better than in any similar period for eight months. Another reports that its actual orders up to January 19 were 10,000 tons heavier than shipments. Conditions are much more active in sheets and tin plate, and the mills are running to a fuller rate of capacity than for months. Plates are still dull but the demand for structural steel is fair, with prices stronger. The demand for scrap is decidedly better, and the higher prices on some grades are holding firm. The coke market is in a waiting attitude, with four or five of the leading makers holding their coke for $2 a ton at oven. It is estimated that steel ingot output at present is on the basis of 60 to 65 per cent. Some of the steel companies are not running to much over 50 per cent., and a few to about 65 per cent. The opinion is that they must have a good deal more business on their books than they have now, before any actual advance in prices can take place. Leading steel mills are still refusing to make long-time contracts at present prices, and most of the orders now coming in are for reasonably prompt shipment.

Pig Iron.—Foundry iron is fairly active, some good-sized sales having been made, but Bessemer and basic continue quiet. The tone of prices on pig iron is stronger, but the market is not any higher. A local open-hearth steel company has bought 500 tons of basic iron for prompt delivery at $12.50 at furnace, and a local steel casting interest bought 1000 tons of Bessemer iron at a shade under $14, Valley furnace. A Valley interest has sold 1000 tons of Bessemer iron at $14 at furnace. A local interest has bought about 2500 tons of forge iron at $12.40 to $12.60 at makers' furnaces. Three of the Aliquippa furnaces of the Jones & Laughlin Steel Company are out of blast for relining and repairs, but one stack is expected to blow in this week. Both stacks of the Brier Hill Steel Company at Youngstown are out; while the company is conserving its basic iron to be used in its open-hearth plant, it is understood to be a seller of Bessemer: We quote standard Bessemer iron at $14; basic, $12.50 to $12.60; No. 2 foundry, $12.75 to $13; malleable Bessemer, $13; gray forge, $12.50, for first quarter delivery, all at Valley furnace, carrying a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—It is announced that the Carnegie Steel Company is practically out of the market as a seller of billets and sheet bars for first quarter, its commitments being so heavy that it will not have any steel to spare other than for regular customers before the second quarter at least. The steel market is firmer, especially on Bessemer, the supply of which is limited more than that of open hearth. We quote Bessemer and open-hearth billets at $20; open-hearth sheet bars, $20; Bessemer sheet bars, $21, all at maker's mill, Youngstown or Pittsburgh. Forging billets are firm at $24 and axle billets, $23, Pittsburgh.

Muck Bar.—There have been no recent sales and we quote best grades, made from all pig iron, at nominally $28, Pittsburgh. This price could be shaded on a firm offer.

Steel Rails.—No important contracts for standard sections have been placed and orders for light rails are quiet. We quote splice bars at 1.50c. and standard section rails at 1.25c. Light rails, rolled from billets, are quoted as follows: 25, 30, 35, 40 and 45-lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14-lb., 1.35c., and 8 and 10-lb., 1.40c., all in carload lots, f.o.b. Pittsburgh.

Plates.—The report that an inquiry had come out from the New York Central Railroad for 500 automobile cars is denied by local car companies, who say they have received no such inquiry. The Chesapeake & Ohio is reported in the market for 1000 box cars, 1000 steel hoppers and 2000 gondolas. The Illinois Central has placed 150 refrigerator cars with the American Car & Foundry Company, and the Union Tank Line is taking bids on 500 steel tank cars. Local steel car companies say they are getting short of work and have only enough orders to carry them over the next month or so. The new demand for plates is quiet, and all the mills are badly in need of new business. We quote ¼-in. and heavier plates at 1.20c., f.o.b. Pittsburgh, but on a very desirable specification 1.15c. could be done.

Structural Material.—New inquiry is only fair, and local fabricators have not taken any important jobs in the past week. It is stated that prices are firmer, and that 1.20c. is being absolutely held. We quote beams and channels up to 15 in. at 1.20c. for desirable orders, f.o.b. Pittsburgh.

Ferroalloys.—While the official price of English 80 per cent. ferromanganese is $45, seaboard, this is being shaded, and it can be obtained at $44 to $44.50. The local interest is understood to be quoting about $45 for domestic 80 per cent. ferromanganese, freight added to point of delivery. We quote English 80 per cent. at $44 seaboard, the freight rate to Pittsburgh being $2.16 per ton, and note sales of about 50 tons at that price. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; over 600 tons, $71, delivered in the Pittsburgh district. We quote 10 per cent. ferrosilicon at $20; 11 per cent., $21, and 12 per cent., $22, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnaces. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over, and 12½c. in less than 2000-lb. lots.

Wire Rods.—The new demand is quiet, and specifications against contracts are not coming in very freely. We quote Bessemer, open-hearth and chain rods at $25.50 to $26, Pittsburgh. A sale of 500 tons of rods, Bessemer or open-hearth at the option of the mill, is reported at the lower price.

Skelp.—Heavy inquiry has come out for both iron and steel skelp, partly due to the Philadelphia Company being in the market for casing and other oil well goods to be rolled from iron. We quote grooved steel skelp at 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.60c. to 1.62½c.; and sheared iron skelp at 1.65c. to 1.67½c.

Iron and Steel Bars.—The new demand for iron and steel bars is fair, and specifications against contracts for steel bars are coming in more freely. All the makers of steel bars are short of work but are hopeful that new business will increase in the near future. The demand for reinforcing steel bars continues active. We quote steel bars at 1.20c. for first quarter delivery, but for desirable business and prompt shipment probably 1.15c. could be done. We quote common iron bars at 1.35c. to 1.40c., Pittsburgh.

Sheets.—Continued encouraging reports are made regarding the sheet trade. One leading mill states that its orders and specifications in the past two weeks have been heavier than at any time for some months. The rate of operation among the mills has been increased, and it is said most of the orders on their books are for delivery within the next month or two. Nearly all are refusing to sell for delivery in second quarter at present prices, but ask $1 a ton advance over prices they will accept for first quarter. The American Sheet & Tin Plate Company is operating close to 70 per cent. of its hot sheet mill capacity. We quote No. 28 Bessemer black sheets at 1.85c. for prompt delivery and 1.90c. for first quarter; No. 28 galvanized sheets at 2.85c. for prompt and 2.90c. for first quarter; Nos. 9 and 10 blue annealed sheets, 1.40c. prompt and 1.45c. for first quarter; No. 28 tin mill black plate, H. R. and A., 1.85c. to 1.90c., and Nos. 29 and 30 at 1.90c.

to 1.95c. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Tin Plate.—There is much activity in the tin plate trade, the mills now running closer to capacity than at any time in six or eight months. The Jones & Laughlin Steel Company has started up its second unit of 12 mills at Aliquippa, which was idle for some time, and all of its 24 mills are running full. The American Sheet & Tin Plate Company, which has a total of 202 hot tin mills, is operating all of them except 25, and these are located in works that are run only in times of extraordinary demand. The three idle plants are Monongahela, with 8 hot mills; Demmler, with 11, and Humbert, with 6. The new demand for tin plate is light, as fully 90 to 95 per cent. of all the tin plate that will be used this year is under contract. Some export business is coming up on which the nominal price on domestic of $3.40 per base box is materially shaded. The mills now appear to have all the work on their books they can possibly turn out to July 1, or longer. On the small amount of new business being placed, prices on 100 lb. cokes range from $3.25 to $3.40 and on ternes from $3.15 to $3.30 per base box.

Shafting.—The demand is reported slightly better, and specifications are being received against some of the large contracts placed recently. While prices are not actualy higher, they are firmer, and the extreme quotation of 65 per cent. off is practically withdrawn. We quote cold-rolled shafting in carload and larger lots at 64 per cent. off and in small lots 60 to 63 per cent. off, depending on the order, delivered in base territory.

Bolts and Rivets.—Nuts, bolts and rivets are in slightly more demand. While prices are reported firmer, they are not any higher. Jobbers and consumers are still placing orders to cover only current needs, and they show no disposition as yet to carry heavy stocks. We quote button-head structural rivets at $1.65 to $1.70 and cone-head boiler rivets at $1.75 to $1.80, in carload lots, an advance of $2 to $3 a ton over these prices being charged for small lots, depending on the order. Terms are 30 days net, less 2 per cent. for cash in 10 days. Discounts on nuts and bolts are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of makers' works.

Coach and lag screws	80 and 20% off
Small carriage bolts, cut threads	75 and 17½% off
Small carriage bolts, rolled threads	80 and 2½% off
Large carriage bolts	70 and 15% off
Small machine bolts, cut threads	80 and 2½% off
Small machine bolts, rolled threads	80 and 7½% off
Large machine bolts	75 and 10 and 2½% off
Machine bolts, C.P.C. & T nuts, small	70 & 12½% off
Machine bolts, C.P.C. & T nuts, large	70 & 12½% off
Square h.p. nuts, blanked and tapped	$6.00 off list
Hexagon nuts	$6.70 off list
C.P.C. & R sq. nuts, blanked and tapped	$5.80 off list
Hexagon nuts, ⅜ and larger	$6.80 off list
Hexagon nuts, smaller than 9/16	$7.40 off list
C.P. plain square nuts	$5.30 off list
C.P. plain hexagon nuts	$5.70 off list
Semi-fin. hex. nuts, ⅝ and larger	85 and 10% off
Semi-fin. hex. nuts, smaller than 9/16	85, 10 & 5% off
Rivets, 7/16 x 6½, smaller and shorter	80 and 10% off
Rivets, metallic tinned, bulk	80 and 10% off
Rivets, tin plated, bulk	80 and 10% off
Rivets, metallic tinned, packages	80 and 10% off
Standard cap screws	75, 10, 10 and 7½% off
Standard set screws	75, 10, 10 and 7½% off

Hoops and Bands.—New orders are being placed a little more freely, and several makers state they are refusing to sell beyond first quarter on the present low market. Specifications against contracts for hoops are coming in more freely. We quote steel bands at 1.20c., with extras as per the steel bar card, and steel hoops 1.35c., maker's mill.

Wire Products.—The new demand is fair, but most of the large trade covered its requirements in wire nails and wire over the next 60 days or longer prior to the withdrawal of prices by the leading interest. On current business, mills state they are adhering to $1.55 on wire nails and $1.35 on plain wire. Shipments of wire and wire nails to jobbers and consumers are heavier now than for some time. We quote wire nails to jobbers at $1.55; cut nails, $1.55; annealed wire, $1.35; galvanized barb wire and fence staples, $1.95; painted barb wire, $1.55, f.o.b. Pittsburgh, per 100 lb., usual terms, actual freight added to point of shipment. We quote woven wire fencing at 74½ per cent. off in carload lots; 73½ per cent. off on 1000-rod lots, and 72½ per cent. on less than 1000-rod lots, all f.o.b. Pittsburgh.

Railroad Spikes.—Only a fair amount of new business is being placed, but some large inquiries from railroads are being figured on, and considerable business is expected to be placed in the near future. Several makers state they are not willing to sell for delivery over all of 1914 on the present low market, and this is holding back to some extent the placing of contracts. We quote railroad spikes in large lots at $1.45 and in carloads at $1.50; small railroad and boat spikes, $1.55 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—One leading mill reports new orders as a little better, but jobbers and consumers are still buying mostly for current needs, and are not disposed to lay in stocks. Specifications against contracts are only fair. Nominal prices on small lots are as follows: Iron finished tire, ½ x 1½ in., and larger, 1.35c., base; under ½ x 1½ in., 1.50c.; planished tire, 1.55c.; channel tire, ¾ to ⅞ and 1 in., 1.85c. to 1.95c.; 1⅛ in. and larger, 1.95c.; toe calk, 1.95c. to 2.05c., base; flat sleigh shoe, 1.70c.; concave and convex, 1.75c.; cutter shoe, tapered or bent, 2.25c. to 2.35c.; spring steel, 1.95c. to 2.05c.; machinery steel, smooth finish, 1.80c. We quote cold-rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.25c.; soft, 3.50c.; coils, hard, 3.15c.; soft, 3.40c.; freight allowed. The usual differentials apply for lighter sizes.

Standard Pipe.—The inquiry of the Philadelphia Company for iron pipe and oil country goods includes 27 miles of 16-in. pipe, 10 miles of 10-in. and 20 miles of smaller sizes. This business is expected to be placed this week. There is also an inquiry in the market for 30 miles of 8-in. pipe for shipment to the Pacific coast. It is said a leading consumer is figuring on the purchase of a very large tonnage of pipe and also of plates for delivery over the next six months. The new demand for lap and butt weld pipe is keeping up very well, one leading interest reporting that it is now operating to about 75 per cent. of capacity against about 60 per cent. last month. It is stated that discounts on both iron and steel pipe are being quite firmly held.

Boiler Tubes.—Some very heavy contracts for boiler tubes from boiler shops have been placed for delivery over the first half of 1914, and specifications against these contracts are now being received by the mills. The new demand for tubes from the locomotive shops is reported better. It is stated that the lower discounts on both steel and iron boiler tubes, which went into effect on January 2, are being fairly well maintained.

Coke.—A prominent steel company east of this city has put out an inquiry for 10,000 to 15,000 tons of furnace coke per month from March 1 up to July 1, and also over the entire year. The Producers Coke Company, the Washington Coal & Coke Company and several other leading makers are holding furnace coke firm at $2 per net ton at oven, and absolutely refuse to shade this price, but several other producers are willing to sell for first half at $1.85 to $1.90. Prices of furnace coke for prompt shipment are slightly weaker. The report of a general reduction in coke workers' wages is untrue, but one leading interest has reduced wages about 10 per cent. at two of its works. We quote strictly high grade blast furnace coke for first half delivery at $2 per net ton at oven, but other standard grades can still be had at $1.85 to $1.90. We quote standard makes of prompt furnace coke at $1.85 to $1.90. Standard makes of 72-hr. foundry coke are held at $2.50 to $2.60 per net ton at oven. The Connellsville Courier reports the output of coke last week in the Upper and Lower Connellsville regions as 260,670 net tons, an increase over the previous week of about 8500 tons.

Old Material.—There has been still further improvement in the scrap trade, the new demand from consumers being heavier, and prices are stronger than for some months. Dealers claim that the visible supply of

scrap has been much decreased in the past month or two, and that large lots cannot be obtained freely at present prices. It is known that several leading dealers have been quietly picking up all the heavy steel melting scrap they could get lately, and other grades as well, and they are now inclined to hold this material for higher prices, which they believe will come before long. Another meeting of the scrap dealers in this city and near Western points was held here Tuesday in the interests of the proposed Scrap Iron Association, but what was done has not been given out. Two large scrap dealers have so far refused to be identified with the movement, and several others are known to be lukewarm. In the past week there have been sales of 5000 to 6000 tons of heavy steel scrap at prices ranging from $11 to $11.25, and it is said as high as $11.50 has been paid in some cases. Turnings are reported to have sold as high as $7.50, and borings at $8.50, delivered at buyer's mill. The price of $13.50 to $13.75 on sheet bar crop ends at shipping point, which has appeared in this report for several weeks, was a typographical error and should have read at consumers' mill; the price at shipping point is about $12.25 to $12.50 per gross ton. Dealers are quoting about as follows per gross ton for delivery in the Pittsburgh and other districts:

Selected heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.00 to $11.25
Compressed side and end sheet scrap	9.75 to 10.00
No. 1 foundry cast	10.75 to 11.00
No. 2 foundry cast	9.75 to 10.00
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	6.75 to 7.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to 13.25
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	7.50 to 7.75
Low phosphorus melting stock	14.00 to 14.25
Iron car axles	24.25 to 24.75
Steel car axles	17.25 to 17.50
Locomotive axles, steel	20.75 to 21.25
Locomotive axles, iron	25.25 to 25.75
No. 1 busheling scrap	10.25 to 10.50
No. 2 busheling scrap	6.25 to 6.75
*Machine shop turnings	7.25 to 7.50
Old carwheels	11.75 to 12.00
*Cast-iron borings	8.00 to 8.25
†Sheet bar crop ends	12.25 to 12.50
Old iron rails	14.25 to 14.50
No. 1 railroad wrought scrap	13.50 to 13.75
Heavy steel axle turnings	8.75 to 9.00
Stove plate	7.50 to 7.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

The local office of the Youngstown Sheet & Tube Company, E. S. Rooney, district sales manager, has been removed from room 1433 to room 1626 Oliver Building, Pittsburgh.

The offices of the J. H. Hillman & Sons Company, dealer in coal and coke, pig iron and steel, ore lands and coal lands, have been removed from the twenty-fifth floor to rooms 1724-1739 Oliver Building, Pittsburgh.

Chicago

CHICAGO, ILL., January 21, 1904.—(*By Telegraph.*)

The market has benefited largely from the buyer's disposition to do business if that is at all possible. The decidedly active inquiry is proof of this. The volume of actual sales increased as it has been by substantial purchases for stock, also reflects this willingness to prepare for such improvement as may develop. But with this inclination to put the best foot forward there is a very apparent caution. The policy of both buyers and sellers is making for a gradual and sound upbuilding. A favorable aspect of the situation is the rather surprising improvement in the business of the small manufacturers. The railroads are still inclined to yield only that business which is solicited to meet the necessities of the mills upon which they are accustomed to depend. Apparently the railroads are not yet ready openly to enter the market for what they need. This is in a measure disappointing. In the Western market, trading continues with 1.15c., Pittsburgh, a firm basis for bars and plates. Shapes are equally well established on the basis of 1.20c. The attitude taken with regard to wire prices by the leading interests appears to have given the preparations for spring trade a good send-off. The buying movement in pig iron has abated very little, but the market is perhaps more ragged than at any time. Purchases of attractive tonnage have been made at prices equivalent to $13.50, at Chicago furnace. Asking prices for scrap are still in the ascendant, and purchases during the week acknowledge the advance in varying degrees.

Pig Iron.—A rather unexpected development in the Chicago pig-iron market has been the increased irregularity in prices for malleable and foundry iron. Until the past week, $14. f.o.b. furnace, had been considered the bottom of the market. More recent transactions, not all of them for large tonnage, have resulted in the booking of standard No. 2 foundry iron and malleable Bessemer at prices at least as low as $13.50, Chicago. About the only improvement furnaces seem to have been able to effect is in the maintenance of full differentials for silicon and in restricting deliveries at these low prices to the first quarter. While the foundries show evidence of having increased the orders on their own books, the present buying movement, which started out very conservatively, now has some of the appearances of overbuying on the part of the melters. The position of the furnaces is somewhat paradoxical. They would be glad to have the second quarter find them with higher-priced iron on their books, and yet in their scramble for tonnage at the present low prices they are in the way of booking considerable tonnage that will not be delivered before the second quarter. The appearance of $10.50, Birmingham, for Southern iron is more general, and some sales are noted, but the price of Northern iron excludes the Southern product from a large part of the Chicago territory. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4	$15.25 to $15.75
Northern coke foundry, No. 1	14.00 to 14.50
Northern coke foundry, No. 2	13.50 to 14.00
Northern coke foundry, No. 3	13.00 to 13.50
Southern coke No. 1 f'dry and 1 soft	15.35 to 15.85
Southern coke, No. 2 f'dry and 2 soft	14.85 to 15.35
Southern coke, No. 3	14.35 to 14.85
Southern coke, No. 4	13.85 to 14.35
Southern gray forge	13.85 to 14.35
Southern mottled	13.35 to 13.85
Malleable Bessemer	13.50 to 14.00
Standard Bessemer	17.65
Basic	13.50 to 14.00
Jackson Co. and Kentucky silvery, 6 per cent.	17.40
Jackson Co. and Kentucky silvery, 8 per cent.	18.40
Jackson Co. and Kentucky silvery, 10 per cent.	19.40

(*By Mail*)

Rails and Track Supplies.—About the only obvious indication as to what the railroads are doing at Chicago regarding the purchase of rails is to be had from the fact that the mill at Gary continues to run steadily. No new contracts of importance are reported. The buying of track fastenings has been noticeably liberal and participation has been general. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; tie plates, $27 to $28 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45-lb., 1.25c.; 16 to 20-lb., 1.30c.; 12-lb., 1.35c.; 8-lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Contracts for fabricated steel reported as placed last week included 424 tons for buildings for the Carter White Lead Company, West Pullman, to be furnished by the Kenwood Bridge Company; 126 tons for the Puget Sound Bridge & Dredging Company, Shelton, Wash., awarded to the American Bridge Company and 157 tons taken by the Minneapolis Steel & Machinery Company for the Douglas A. Fiske Store at Minneapolis. A theater building also at Minneapolis being erected for Saxe Bros. and requiring 133 tons was also provided for in the matter of steel. Reports from fabricators at Chicago and Milwaukee indicate that their capacity for the next three months is very comfortably engaged with but few exceptions. Mill

business in structural shapes is very clearly quotable on the basis of 1.20c., Pittsburgh, for first quarter with an additional dollar per ton asked for full half contracts. There appears to be less departure from the one price in structural negotiations than with respect to the other principal products. Tonnage, while appreciably larger than in the months preceding January 1, is not sufficient to create any considerable accumulation on mill books. We quote for mill shipment, Chicago delivery, 1.38c.

Where the customer's attention is diverted at all from his own stock taking it seems to be in the direction of his requirements from mill rather than stock. Store trade is accordingly rather dull for the present. We quote for Chicago delivery from stock 1.75c.

Plates.—There is some evidence of disappointment among the makers of plates over the failure of the railroads to appear more actively as buyers of equipment requiring plates. It is felt that the mill situation cannot develop any great strength in the absence of railroad purchases. Something of the situation is reflected in the fact that plate quotations continue on the basis of 1.15c. Pittsburgh, or $1 a ton lower than shapes. Some of the eastern mills are, on the contrary, holding shapes and plates and bars as well, on a parity at 1.20c. Pittsburgh, and it is generally understood that Pittsburgh mills are making lower quotations in this market than in their immediate territory. We quote for Chicago delivery from mill 1.33c. to 1.38c.

For Chicago delivery from store we quote 1.75c.

Sheets.—The ability of local sheet mills to secure specifications in quantities up to 1000 tons without having to shade the Pittsburgh basis of 1.85c. is taken to indicate the firming up of the market to the extent of eliminating the concessions below that price. Tonnage is coming out quite freely and what may be called an easy situation prevails. For second quarter contracts an advance of $2 is being asked by the local mills. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.68c. to 1.73c.; No. 28 black, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.

For sheets out of store we quote for Chicago delivery as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.50c. to 3.60c.

Bars.—Steel bar tonnage continues to show a gratifying increase in volume despite the conservative attitude of the implement interests. The business being booked is for the most part accompanied by shipping instructions and the mills are still pursuing a policy of postponing contracts for second quarter. Quotations are quite generally the equivalent of 1.15c. Pittsburgh, although 1.20c. is being asked on some business. Bar iron shows less improvement than steel both as regards volume and price. The reappearance of the 1.10c. price leaves no room for doubt that additional business is still very attractive to the mills. A little better business has developed in hard steel bars and of reinforcing bars a round tonnage will be required for the Loeb Arcade Building at Minneapolis. Sales of steel in semi-finished form have had a decided importance in this market. One tidewater steel company sold 4000 tons of billets through its Chicago office in the past fortnight. We quote for mill shipment as follows: Bar iron, 1.10c. to 1.15c.; soft steel bars, 1.33c.; hard steel bars, 1.30c.; shafting in carloads, 65 per cent. off; less than carloads, 60 per cent. off.

We quote above prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over, and usual card extras for smaller sizes; shafting 57 per cent. off.

Rivets and Bolts.—A number of carload sales of rivets are reported and makers in this territory are less disposed to make extreme concessions. We quote from mill as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 80-12½; cut thread, 80-5; larger sizes, 75-10; machine bolts up to ⅜ x 4 in., rolled thread, 80-15; cut thread, 80-10; large size, 75-15; coach screws, 80-15-10; hot pressed nuts, square head, $6.20 off per cwt.; hexagon, $7 off per cwt. Structural rivets, ½ to 1¼ in., 1.88c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Out of store we quote for structural rivets, 2.40c., and for boiler rivets, 2.60c. Machine bolts up to ⅜ x 4 in., 70-10-10; larger sizes, 70-12½; carriage bolts up to ⅜ x 6 in., 75-10; larger sizes, 70-12½ off. Hot pressed nuts, square head, $5.50, and hexagon, $6.20 off per cwt.

Wire Products.—The action of the leading interest in shaping the market with some definiteness has been sufficiently reassuring to bring out a very substantial buying for the spring trade. Delayed as it has been some 30 to 45 days beyond the usual time, this covering is taking the form of prompt shipment requisitions. Reports state that the retail demand is already wakening and that stocks in distributers' hands will be taxed severely. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.53; wire nails, $1.73; painted barb wire, $1.73; galvanized, $2.13; polished staples, $1.73; galvanized, $2.13, all Chicago.

Cast-Iron Pipe.—The award of pipe at St. Paul involving something over 3000 tons distributed this between the American Cast Iron Pipe Company and the Lynchburg plant. At Detroit the United States Cast Iron Pipe & Foundry Company was awarded about 3000 tons of gas pipe. In the present week about 4000 tons of pipe will be placed at Minneapolis and 5200 tons at Chicago. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $27; 6 to 12 in., $25; 16 in. and up, $24, with $1 extra for gas pipe.

Old Material.—The market for scrap at Chicago has undoubtedly broadened and in addition to inquiry for heavy melting steel from the principal melter of that grade in this market substantial purchases have been made by two important consumers whose operations are associated with the building of railroad equipment. One of the local rolling mills has also been a buyer of moderate tonnage. This buying has served to establish the fact that scrap prices are higher, although not to the full extent represented by dealers' asking prices. This market has been called upon to absorb rather heavy railroad lists the past few weeks, little of which has thus far been taken by consumers. Country dealers likewise seem to have plenty of scrap in their yards and it has been impossible therefore to avoid entirely transactions where the dealer is really more anxious to sell than the melter is to buy. Railroad offerings this week total only 2350 tons, including 1300 tons from the Northern Pacific, 800 tons from the Chicago, St. Paul, Minneapolis & Omaha and 250 tons from the Grand Trunk. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	11.00 to 11.50
Old steel rails, less than 3 ft.	10.25 to 10.75
Relaying rails, standard section, subject to inspection	24.00
Old carwheels	11.75 to 12.25
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.50 to 10.00
Shoveling steel	8.50 to 9.00
Steel axle turnings	6.50 to 7.00

Per Net Ton

Iron angles and splice bars	$12.25 to $12.75
Iron arch bars and transoms	12.25 to 12.75
Steel angle bars	8.50 to 9.00
Iron car axles	17.25 to 17.75
Steel car axles	12.50 to 13.00
No. 1 railroad wrought	8.75 to 9.25
No. 2 railroad wrought	8.25 to 8.75
Cut forge	8.25 to 8.75
Steel knuckles and couplers	8.75 to 9.25
Steel springs	9.25 to 9.75
Locomotive tires, smooth	10.75 to 11.25
Machine shop turnings	4.50 to 4.75
Cast borings	4.25 to 4.75
No. 1 busheling	7.75 to 8.00
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	6.00 to 6.50
Boiler punchings	9.50 to 10.00
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.50 to 10.00
Grate bars	8.50 to 9.00
Railroad malleable	9.50 to 9.75
Agricultural malleable	8.25 to 8.75
Pipes and flues	7.00 to 7.50

Leopold Cohen, conducting a scrap-iron business at West Thirty-first street and South Homan avenue, Chicago, has incorporated as the Leopold Cohen Iron Company, with a capital stock of $10,000.

Philadelphia

PHILADELPHIA, PA., January 20, 1914.

Not only has sentiment been better but a very encouraging volume of new business in nearly all lines of crude and finished materials is reported. Prices for all classes of rolled products appear to be bottomed and in instances there is a definite upward movement, particularly when forward deliveries are involved. Cast-iron pipe makers continue active buyers of pig iron. Prices of foundry grades are firmer, but unchanged. Moderate sales of steel making grades have been made. In finished materials contracting has been more in evidence and $1 advance on second quarter contracts is being more freely obtained. Specifications have been heavier in nearly all lines. The billet market continues to drag. Iron bars show a trifle more strength. A sharp upward turn in some grades of old material is noted. On good buying by one interest No. 1 heavy steel scrap moved up practically $1 a ton.

Iron Ore.—Little interest is shown by consumers. One buyer has taken a cargo of resale ore at a cheap price. Importations during the week ended January 17 included 4900 tons from Cuba and 4000 tons from Mediterranean ports.

Pig Iron.—Unconfirmed reports are to the effect that the leading cast-iron pipe maker's recent purchases of pig iron will aggregate close to 100,000 tons and that 80,000 tons of this total was Southern iron. Pipe makers in this district have been buying quite freely the past week. In most cases odd lots, at prices based on analysis, were moved, but in several instances lots of 1000 tons or more were involved. Soil-pipe founders have also been making good purchases. No. 3 foundry and foundry forge, for pipe making command about $14, delivered at Delaware River points. Current sales of the higher foundry grades have been heavier, in a number of cases, the movement of last week being even greater than that of the week previous. While there has been a disposition toward firmness, since the withdrawal of the low competitive Buffalo prices, a number of sellers have booked orders for first quarter and even more extended delivery at $14.50, delivered here, for standard brands of eastern Pennsylvania No. 2X. At the same time other makers are holding firmly at $14.75 and $15, and booking a fair volume of business. Virginia foundry iron has been more active. Sales continue to be made freely at $12.75 at furnace for No. 2X and $12.50 for No. 2 plain. Unconfirmed reports are to the effect that these figures could be shaded. At the same time the leading interest is said to be holding at $13 at furnace, for second quarter No. 2X. Rolling mill forge iron remains inactive. Belated reports of a sale of 2000 tons of basic iron to an Eastern steel maker, followed by a further recent sale of a like tonnage by another maker at $14, delivered, first quarter shipment, have come out. Steel casting plants have been further buyers of low phosphorus iron, aggregating probably 1000 tons. Other buyers continue to take small lots from time to time, rather than buying in large quantities. A moderate amount of business is before the trade. General pig-iron inquiry continues fairly good, buyers endeavoring to place orders at recent low prices and also obtain deliveries as far extended as possible. It is generally considered that at recent quotations, prices have been at the bottom and that the future movement, if any, will be upward. In some instances sellers have booked orders covering delivery over the first half at current quotations, but as a rule sellers are disinclined to sell far ahead. The following range is named for standard brands, delivered in buyers' yards in this district, during the first quarter.

Eastern Penn. No. 2 X foundry	$14.50 to $15.00
Eastern Pennsylvania No. 2 plain	14.25 to 14.75
Virginia No. 2 X foundry	15.55 to 16.00
Virginia No. 2 plain	15.30 to 15.50
Gray forge	14.00 to 14.25
Basic	14.00 to 14.25
Standard low phosphorus	21.00 to 21.25

Ferroalloys.—New business has been light, being confined to odd lots, which in the aggregate do not appear to exceed 150 tons of 80 per cent. ferromanganese, for prompt shipment at $45, seaboard. Ferrosilicon is in small demand. Importations the past week totaled 255 tons of ferromanganese from England.

Billets.—New business has been very quiet. Consumers hold off for lower prices and again talk importation of foreign steel, which, it is said, might be brought in at $22, seaboard. On current small orders, which make up the bulk of the buying, mills hold at $22.40, delivered, for basic open-hearth rolling billets, but would probably take tonnage orders at $21.50, although not willing to sell for forward delivery at that price. The leading producer is operating its blooming mill on 8 hours a day, but its steel plant and blast furnaces remain idle. Forging billets command an advance of $4 to $5 over rolling billets, according to specification.

Plates.—Mills continue to receive a satisfactory volume of new business. Orders of a miscellaneous character have been comparatively good and there has been more contracting, both for first and second quarter. First quarter business is usually taken at 1.35c. delivered here, but on more extended contracts mills have been holding pretty firmly at 1.40c. Mill operations show irregularity, although in one instance 75 per cent. of capacity has been maintained. Some of the Western mills are showing more firmness.

Structural Material.—The demand for miscellaneous plain material has been a trifle more active. A fair volume of small bridge work is coming from the railroads. After some uncertainty, it is now stated that the Baltimore Bargain House has gone to concrete. It is also stated that the fabricated steel work, 2500 tons, for the new Finance Company Building, in Penn square, this city, has finally been secured by the leading interest. The volume of business coming to Eastern mills is still below normal and some plants continue to operate at but 50 per cent. of capacity. Prices of plain shapes are unchanged at 1.35c. to 1.40c., delivered in this district.

Sheets.—Business continues spotty and mostly for prompt shipment. Eastern mills still receive sufficient small orders and specifications to enable them to run at full capacity, but rolling schedules seldom exceed a few days ahead. Less is heard of price concessions, 1.55c. to 1.60c. about representing the range for No. 10 blue annealed sheets, delivered in this vicinity.

Bars.—A number of bar-iron mills are operating on a better basis, having more business on their books. Steel bar makers also report better specifications on contracts as well as more orders. New orders, as a rule, have not been large but less disposition to shade prices is noted. In but few instances can 1.12½c. mill be done for ordinary iron bars, makers holding at 1.22½ to 1.27½c. delivered here. Steel bar makers are holding comparatively firmly at 1.35c. to 1.40c. here, according to the nature of the business and time of delivery.

Coke.—Business in both furnace and foundry grades has been quieter. Certain interests hold at $2 at oven for forward furnace coke but $1.90 can be done, with prompt furnace coke ranging from $1.75 to $1.85. Foundry coke has been gradually becoming easier and it is reported that good brands are available for early delivery at $2.60 to $2.85. The following range of prices, per net ton, delivered in buyers' yards in this district, is named:

Connellsville furnace coke	$3.90 to $4.40
Connellsville foundry coke	4.80 to 5.15
Mountain furnace coke	3.60 to 4.10
Mountain foundry coke	4.50 to 4.85

Old Material.—Greater activity has developed, with a corresponding upturn in prices. No. 1 heavy melting steel, which a week ago sold at $10 to $10.25, advanced on purchases of upward of 10,000 tons, in various sized lots, by one melter, to $11, delivered, and merchants now ask $11.50. Considerable steel yet remains to be delivered at lower prices. Rolling mill grades are more active. No. 1 railroad wrought was sold at better than $13 and wrought pipe brought up to $10, delivered. Borings and turnings show increasing strength. Inquiry for all grades has been better and the market has a decidedly stronger tone. The following quotations about represent the market for

deliveries in buyers' yards in this district, covering eastern Pennsylvania and taking freight rate varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel	$11.00 to $11.50
Old steel rails, rerolling	12.50 to 13.00
Low phosphorus heavy melting steel scrap (nominal)	14.00 to 14.50
Old steel axles	15.50 to 16.00
Old iron axles (nominal)	21.00
Old iron rails (nominal)	15.50
Old carwheels	12.50 to 13.00
No. 1 railroad wrought	13.25 to 13.75
Wrought-iron pipe	9.50 to 10.00
No. 1 forge fire	8.50 to 9.00
Bundled sheets	8.50 to 9.00
No. 2 light iron (nominal)	5.00
No. 2 busheling (nominal)	8.00 to 8.50
Wrought turnings	7.50 to 8.00
Cast borings	8.00 to 8.50
Machinery cast	12.00 to 12.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75
Railroad malleable (nominal)	9.00 to 9.50

Walsh's Sons & Co., wholesale dealers in scrap iron and metals, 295-305 Passaic street, Newark, N. J., have engaged Allen R. Hoffer & Co., Philadelphia, as their eastern Pennsylvania selling agents, for scrap iron and steel.

Cincinnati

CINCINNATI, O., January 21, 1914.—(*By Telegraph.*)

Pig Iron.—A round tonnage of Southern warrant iron has been quietly put on the market lately at around $10.50, Birmingham basis, on No. 2 foundry for any shipment during the first half. This iron is from an idle Tennessee furnace, now in the hands of a receiver, and includes several different grades. It is reported that one or two Southern producers are willing to meet this competition but are not disposed to take on business at the price named except for prompt shipment. Foundry iron sales in this immediate vicinity are confined to small lots. The majority of the inquiries previously reported are still under negotiation, although the melt of neither foundry nor basic shows any increase. There is generally a more optimistic feeling entertained by both buyers and sellers. There have been a few deviations from the announced intention of Hanging Rock producers to maintain a minimum price of $13, Ironton, but the amount of iron contracted for slightly below this figure is negligible, and as far as known none can be bought to-day under the quotations named below. Approximately 4000 tons of Northern foundry iron was contracted for by two central Ohio firms for first half shipment, and several Indiana melters took small lots of both Southern and Northern grades for nearby delivery. In addition to unclosed inquiries previously mentioned, there is one for 1000 tons of Southern iron from a Michigan consumer. Conflicting reports are circulating as to the alleged purchase of 20,000 tons of Northern basic by a southern Ohio rolling mill. This transaction has not yet been consummated, but definite action is expected to be taken before the week is up. The silvery irons show more activity, but as low as $16 at furnace can be done for first quarter shipment, based on an 8 per cent. analysis. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$14.25 to $14.75
Southern coke, No. 2 f'dry and 2 soft	13.75 to 14.25
Southern coke, No. 3 foundry	13.25 to 13.75
Southern, No. 4 foundry	12.75 to 13.25
Southern gray forge	12.25 to 12.75
Ohio silvery, 8 per cent. silicon	17.20 to 17.70
Southern Ohio coke, No. 1	15.20 to 15.70
Southern Ohio coke, No. 2	14.20 to 14.70
Southern Ohio coke, No. 3	13.95 to 14.20
Southern Ohio malleable Bessemer	14.20 to 14.70
Basic, Northern	14.20 to 14.70
Lake Superior charcoal	16.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(*By Mail*)

Coke.—Comparatively little furnace coke is yet to be contracted for in this territory. Connellsville leading brands are quoted around $2 per net ton at oven for prompt shipment, with the probable chance of a buyer being able to obtain a small quantity at $1.90. Both Wise County and Pocahontas furnace coke is quoted higher, from $2 to $2.25 at oven being the ruling quotations in those districts. Foundry coke is only being sold in small lots, and there is little future contracting; from $2.50 to $2.80 is approximately the present market range. Quite a large number of ovens have been shut down in all three producing districts.

Finished Material.—Mill agencies report a very good business for prompt shipment. The local warehouse trade has slackened a trifle, although there is a demand for structural material that is somewhat out of its usual proportion at this season of the year. This is due to the open weather that has enabled contractors to rush building operations. Steel bars are quoted from stock at 1.75c. to 1.85c., and structural shapes and plates 1.85c. to 1.90c. Prices on sheets are unchanged, and there is a general undercurrent of feeling that would indicate a marking up of quotations at an early date. We quote No. 28 black sheets at 2c. to 2.05c., and galvanized at 3.05c., f.o.b. cars Cincinnati or Newport, Ky. Railway track material is in poor demand.

Old Material.—There continues to be a more hopeful general report from nearly all dealers, which is attributed to a better demand from the rolling mills and other consumers of scrap iron. Railroad offerings are quite heavy for the season, but dealers are slow in taking on any larger stocks. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton	
Bundled sheet scrap	$6.25 to $6.75
Old iron rails	10.75 to 11.75
Relaying rails, 50 lb. and up	19.50 to 20.00
Rerolling rails, steel	10.75 to 11.25
Melting steel rails	9.00 to 9.50
Old carwheels	10.00 to 10.50
Per Net Ton	
No. 1 railroad wrought	$8.25 to $8.75
Cast borings	4.25 to 4.75
Steel turnings	4.25 to 4.75
No. 1 cast scrap	8.50 to 9.00
Burnt scrap	5.75 to 6.25
Old iron axles	15.75 to 16.25
Locomotive tires (smooth inside)	9.50 to 10.00
Pipes and flues	5.50 to 6.00
Malleable and steel scrap	6.50 to 7.00
Railroad tank and sheet scrap	4.25 to 4.75

Cleveland

CLEVELAND, OHIO, January 20, 1914.

Iron Ore.—The operation of several ore properties has been suspended during the past week or two, and the shutting down of other underground mines will probably be ordered at annual meetings of mining companies to be held within the next few days. In the mines that have recently been shut down the pumps are being kept running so that the operation of the mines can be resumed with little delay when conditions warrant. The buying movement is likely to be deferred until March or April. We quote 1913 prices as follows: Old range Bessemer, $4.40; Mesaba Bessemer, $4.15; old range non-Bessemer, $3.50; Mesaba non-Bessemer, $3.40.

Coke.—Corrigan, McKinney & Co., who early in the month threatened to blow out their blast furnaces rather than to pay the prices that were asked for coke, set $1.75 as a maximum price they would pay and claim to have so far secured enough standard coke at this price for prompt shipment to keep their stacks running, and so far none has been blown out. The ruling quotations on furnace coke are $1.80 to $1.90 per net ton for spot shipment and $1.90 to $2 for contracts. Foundry coke is quiet with prices unchanged at $2.50 to $2.75 for standard brands.

Pig Iron.—The demand for foundry iron continues quite active. Considerable tonnage in small lots was booked and a fair volume of inquiry is still coming out. Sales are being made at the low prices that have prevailed recently, but a firmer feeling has developed and there is an indication that sellers who are making the low quotations will soon make some advance in prices. Foundry iron is quoted at $12.75 to $13, Cleveland and Valley furnace. However, one Valley furnace is naming $13.25 as a minimum quotation and is making sales at that price. Recent sales include

considerable tonnage to Detroit stove manufacturers, most of whom are now covered for first quarter or first half requirements. Among the new inquiries is one from a Mansfield, Ohio, stove plant for 700 tons of foundry iron. Southern iron is not active, but prices are firm at $10.75 to $11, Birmingham. Ohio silvery iron is quoted at $16.50 at furnace for 8 per cent. silicon for small lots, but on round lots a $16 price will be named. We quote delivered Cleveland as follows:

Bessemer	$14.90
Basic	13.00
Northern No. 2 foundry	13.50
Southern No. 2 foundry	$15.10 to 15.35
Jackson Co. silvery, 8 per cent. silicon	17.80 to 18.10

Finished Iron and Steel.—The demand continues active and a very optimistic feeling prevails, in disregard of the publicity that has been given to pessimistic reports. Bookings of the week include a good volume of orders accompanied by specifications and a heavy tonnage in contracts. The market is stiffening up somewhat and some of the mills that have been making mimimum prices have advanced their quotations for future delivery. The demand for structural material shows a decided improvement and new inquiries now pending for specific work in this territory aggregate fully 10,000 tons. This includes 1900 to 2000 tons for bridges for the Cleveland & Youngstown Railway Company, the low bid for which has been made by the American Bridge Company. The improved condition of the steel industry in Cleveland is shown by the operation of the local mills. The plant of the Upson Steel Company is running full with orders sufficient to keep it busy for seevral weeks. The Otis Steel Company will run its plate mill without a shut-down during January, which is a decided improvement as compared with its operations during the latter part of last year. The Union and Empire Rolling Mills have run three weeks without a shut-down. In Youngstown the Bessemer plant of the Republic Iron & Steel Company started up Monday and the company is reported to have enough orders to keep both its open-hearth and Bessemer plants busy until about March 1. Steel bars are firm at 1.20c. Pittsburgh for prompt shipment and 1.20c. to 1.25c. for the first quarter. One mill has advanced its second quarter price to 1.30c., which is now the general quotation for that delivery. On an inquiry for 2600 tons of steel bars for reinforcing work in connection with the Superior avenue bridge for delivery over about three years quotations of 1.30c. have been made for all of 1914. The plate market is firmer and 1.20c. Pittsburgh is now more generally the minimum quotation. It is doubtful if this price can be shaded on boiler plates. Structural material is quoted at 1.25c. for the first quarter and 1.30c. for the second quarter. Bar iron is unchanged at 1.20c. Cleveland. The demand for sheets has improved and many contracts are being placed. Black sheets are quoted at 1.85c. and galvanized sheets at 2.85c. for No. 28. Some contracts for the first quarter have been made at these prices and $1 a ton higher. For the second quarter 2c. and 3c. are being quoted. We quote blue annealed sheets at 1.40c. for prompt shipment and the first quarter. The demand for rivets is quite active and considerable contract business has been booked at prices that have prevailed recently. We quote rivets at 1.55c. for structural and 1.65c. for boiler for spot shipment and $1 a ton higher for the first half for desirable orders, small lots commanding higher prices. Some unusually desirable business has been booked for the first half at spot prices. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Old Material.—While the demand shows little improvement dealers are looking for a more active market and have advanced prices on several grades. Consumers are unwilling yet to pay any higher prices than have recently prevailed, but will be able to secure very little scrap, except at an advance. Prices on heavy melting steel, borings, turnings, busheling and railroad wrought have been marked up 25c. a ton and railroad malleable is about 75c. a ton higher. A local consumer is in the market for old busheling at $8. Local steel plants are still well supplied and are not active in the market. We quote f.o.b. Cleveland as follows:

Per Gross Ton

Old steel rails, rerolling	$12.00 to $12.50
Old iron rails	12.50 to 13.00
Steel car axles	16.50 to 17.00
Heavy melting steel	9.50 to 10.00
Old carwheels	11.50 to 12.00
Relaying rails, 50 lb. and over	23.00 to 25.00
Agricultural malleable	9.00 to 9.50
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	7.00 to 7.50
Bundled tin scrap	11.00 to 11.50

Per Net Ton

Iron car axles	$18.50 to $19.00
Cast borings	5.75 to 6.00
Iron and steel turnings and drillings	4.75 to 5.00
Steel axle turnings	5.75 to 6.00
No. 1 busheling	8.00 to 8.25
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	10.50 to 11.00
Stove plate	8.00 to 8.50

German Markets Still Halting

Reductions in Pig Iron and Some Steel Products

BERLIN, January 8, 1914.

News from the iron market is contradictory. On the Düsseldorf Exchange the prices of pig iron were readjusted in accordance with the new list prices of the Syndicate, which went into effect January 1. The cuts range between 2 and 4 marks (48c. and 95c.). Otherwise, too, the market shows a weak tendency. The following export prices, f.o.b Antwerp, were quoted several days ago by the Koelnische Zeitung, the previous prices being given in connection: Steel bars, 91 marks ($21.66), against 92 to 93 marks, ($21.90 to $22.13); beams, 102 to 105 marks ($24.28 to $24.99), against 105 to 108 marks ($24.99 to $25.70); angles, 106 to 108 marks ($25.23 to $25.70), against 109 to 112 marks ($25.94 to $26.66); steel plates, 101 marks ($24.04), against 102 to 103 marks ($24.28 to $24.51); Nos. 12 to 14 sheets, 107 marks ($25.46), against 108 marks ($25.70); No. 20 sheets, 128 marks ($30.47), against 128 to 129 marks ($30.47 to $30.70); rivet bars, 93 marks ($22.13), against 94 to 95 marks ($22.37 to $22.61); galvanized barbed wire, 177.50 marks ($42.25), against 180 marks ($42.84).

At a public letting of contracts for steel supplies by the shops attached to the Government coal mines at Saarbrücken several days ago, cheaper prices were noted than had been regarded as the usual market price. The lowest offer of bars of fixed length was 96 marks ($22.85) and for varying lengths 105 marks ($24.99). These prices were for only small quantities. At the same time an auction of old rails and other material by the railroad authorities at Cassel also brought out disappointing prices. Relaying steel rails brought only 95.10 to 98.20 marks ($22.63 to $23.37); another lot, 100.10 to 103.80 marks ($23.82 to $24.70). These lots included the fish-plates belonging to them. Other lots, without fish-plates, brought 63.30 to 69.40 marks ($15.07 to $16.52).

On the other hand, better prices for bars were reported today in two cases. The Hoesch Company, Dortmund, which had been taking orders for this quarter at 97 marks ($23.09), has now begun to sell for the second quarter at 98 marks ($23.32). The Gewerkschaft Deutscher Kaiser will also demand higher prices for the second quarter, after having sold for this quarter at 98.50 marks ($23.44). Krupp, Phönix and Gutehoffhungshütte are all asking 98 to 99 marks ($23.32 to $23.56) for the June quarter.

Record Pig Iron Output in 1913

The December production of pig iron, given out yesterday, amounted to 1,609,000 metric tons, comparing with 1,587,000 tons for November and 1,566,000 tons for December, 1912. The rate of daily production was 51,925 tons, as against 52,910 tons in November. The rate has therefore sunk considerably more rapidly since November. The total production for the year was 19,291,920 metric tons, comparing with 17,868,909 tons for 1912, and 15,557,030 tons for 1911.

The Prussian Minister of Railways and Public Works is in negotiation with the Steel Works Union

regarding the renewal of contracts for steel rails and other supplies. It is understood that he is trying to force through a lower scale of prices, using as an argument the state of prostration in the trade. The total of the orders will be fully as great as in previous years, and probably larger.

The French ore producers in the Briey district have latterly been compelled to reduce their production, in order not to allow too large supplies to accumulate at the mines. The trade organization has strictly adhered to its prices of a year ago, and this makes it difficult for it to market the full product of the mines.

Belgian prices are again weak. Bands for export were reduced 1 to 2s. (24c. to 49c.), to 114 to 116s. ($27.74 to $28.22) at the end of last week, and round bars to 98 to 100s. ($23.85 to $24.33).

Birmingham

BIRMINGHAM, ALA., January 19, 1914.

Pig Iron.—Large sales of Southern pig iron have been made, estimated at something like 100,000 tons, the major portion of which is believed to have been contracted for around $10.75, with some at $11. Four interests have sold more than their month's manufacture. One, which has always quoted $11, is credited with sales of 20,000 tons. Two others, which have acknowledged the $10.75 basis, have sold 12,000 to 20,000 tons each. The leading interest is the reported seller of 50,000 tons to the principal pipe company. In addition a large tonnage of basic iron, say 20,000 tons, was recently contracted for under the foundry basis. No furnace interest is quoting under $11, those who sold liberally at $10.75 having returned to the former price for future transactions. The bulk of the business contracted for is for the first quarter, but some extends over the first half. The question in the iron market is, Will the $11 level, re-established since the large purchases made under that figure, stand? We quote, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$11.25 to $11.50
No. 2 foundry and soft	10.75 to 11.00
No. 3 foundry	10.25 to 10.50
No. 4 foundry	10.00 to 10.25
Gray forge	9.75 to 10.00
Basic	10.50 to 10.75
Charcoal	23.50 to 24.00

Cast-Iron Pipe.—The pipe interests have taken on new life. There have been some large orders and more are in sight. The city of Portland, Ore., has ordered 1500 tons of water pipe and is expected to take much more. Gas companies have also ordered with some liberality. Plants are now operating on a larger scale and the feeling is better. Prices are maintained. We quote, per net ton, f.o.b. yards, as follows: 4-in., $22; 6-in. and upward, $20, with $1 added for gas pipe.

Old Material.—While the market for scrap has not recovered buoyancy, the volume of business has perceptibly increased. There have been transactions of considerable size in both heavy and light material, and prices tend to firmness, although quotations cannot be relied upon as an absolute index of business. Dealers are inclined to take on stocks. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles (small)	$15.00 to $15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	12.50 to 13.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 machinery cast	10.50 to 11.00
No. 1 steel scrap	10.50 to 11.00
Tram carwheels	10.50 to 11.00
Standard carwheels	12.00 to 12.50
Light cast and stove plates	9.00 to 9.50

Coal and Coke.—The coal situation shows some improvement with the large steam coal operators, who have been securing new customers and have not lost any of the old. The Alabama Fuel & Iron Company has entered the bunkerage business at Mobile and has sold 50,000 tons to three interests. The Pratt Consolidated is extending operations at Mobile, New Orleans and Pensacola. Prices have slightly improved. Coke is more in demand and prices tend to stiffen somewhat. Indications point to generally better conditions. The addition to the Semet-Solvay by-product coke plant at the Holt furnace plant of the Central Coal & Iron Company has been completed. We quote, per net ton, f.o.b. oven, as follows: Furnace coke, $2.50 to $3; foundry, $3.50 to $4.

Large Sales of Hematite Pig Iron

British Market Improves on Easier Money—German Billet Prices Firmer

(By Cable)

LONDON, England, January 21, 1914.

Easier money has caused a quick change in sentiment. There is more inclination to buy. A big business has been done in hematite pig iron, and some furnaces are being restarted. Fuel is rather easier. Semi-finished steel is generally unchanged, but German prices are firmer. There are no fresh developments in finished steel. Mills here have taken the Servian rail order. The Dominion Iron & Steel Company in Nova Scotia booked 4000 tons of rails for Australia. Tin plates are quiet. Stocks in Connal's stores are 134,806 tons, against 134,015 tons last week. We quote as follows:

Tin plates, coke 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 12s. 7½d. ($3.07).

(The following prices are per ton of 2240 lb.):

Cleveland pig iron warrants (Tuesday), 50s. 8d. ($12.32), against 50s. 5d. ($12.26) one week ago.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 51s. 3d. ($12.47) against 50s. 9d. ($12.35) last week.

Hematite pig iron, f.o.b. Tees, 62s. ($15.08) against 61s. 6d. ($14.96) last week.

Ferromanganese, £9 5s. ($45.01).

Steel sheet bars (Welsh), delivered at works in Swansea Valley, £4 10s. ($21.89).

Steel bars, export, f.o.b. Clyde, £6 ($29.20).

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £5 7s. 6d. ($26.15).

Steel ship plates, Scotch, delivered local yards, £6 17s. 6d. ($33.46).

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 ($43.80).

Steel rails, export, f.o.b. works port, £6 2s. 6d. ($29.81).

(The following prices are per export ton of 1015 kilos, equivalent to 2237.669 lb.):

German sheet bars, f.o.b. Antwerp, 82s. ($19.94), an advance of 1s.

German 2-in. billets, f.o.b. Antwerp, 77s. ($18.72), an advance of 1s.

German basic steel bars, f.o.b. Antwerp, £4 11s. to £4 12s. ($22.13 to $22.37).

German joists, f.o.b. Antwerp, £5 2s. to £5 5s. ($24.82 to $25.55).

St. Louis

ST. LOUIS, MO., January 19, 1914.

Added activity has prevailed and it has been of a character to indicate permanence of better feeling.

Pig Iron.—Sales have been exceptionally heavy and will aggregate at least 30,000 tons, if not more, while there is a still larger quantity remaining on inquiry. Included in the sales were 12,500 tons by one interest, about 5000 tons by another and about 7500 tons by still another. Individually the sales have included one of 5000 tons of No. 2 Northern for Ohio delivery, handled through the purchasing office here of an industry with scattered plants. Other sales have been 1000 tons of malleable, 1000 tons of high manganese and 1000 tons of chilled cast foundry. Stove foundry interests in Quincy, Burlington, Hannibal and Belleville have taken fully 8000 tons in the last few days. The inquiries pending include 20,000 tons of basic, 10,000 tons of basic, 2000 tons of malleable, 1500 tons of 8 per cent. silicon and 1000 tons of No. 1 and No. 2 Northern equally divided. The basic tonnage

promises to be sharply competed for between northern and southern furnaces.

Coke.—Transactions have not been large and the inquiry reported last week for heavy tonnage has not yet been closed. By-product coke is quoted on the Connellsville basis.

Finished Iron and Steel.—The aggregate of ordinary business has been heavier than in the preceding week. The demand for track fastenings has been good. Plates have been quiet, but a shade better than at previous report through some small car orders placed. Bars, both ordinary and reinforcing, are in fair request. Prices on structural material, etc., are quite well held at 1.20c., Pittsburgh.

Old Material.—The scrap market has continued to show a better tone. Steel mill and foundry grades have been notably strong with an increasing demand. Relaying rails are still in excellent demand, with the prices quite well held. The lists out last week went at better prices than heretofore. No new ones appeared. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton

Old iron rails	$11.25 to $11.50
Old steel rails, rerolling	10.75 to 11.25
Old steel rails, less than 3 feet	9.75 to 10.25
Relaying rails, standard section, subject to inspection	23.00 to 24.00
Old carwheels	11.25 to 11.75
No. 1 R. R. heavy melting steel scrap	10.00 to 10.50
Shoveling steel	8.50 to 9.00
Frogs, switches and guards cut apart	10.00 to 10.50
Bundled sheet scrap	5.00 to 5.50

Per Net Ton

Iron angle bars	$10.25 to $10.50
Steel angle bars	8.25 to 8.75
Iron car axles	16.00 to 16.50
Steel car axles	11.75 to 12.25
Wrought arch bars and transoms	11.25 to 11.75
No. 1 railroad wrought	9.00 to 9.50
No. 2 railroad wrought	8.50 to 9.00
Railroad springs	8.75 to 9.25
Steel couplers and knuckles	8.75 to 9.25
Locomotive tires, 42 in. and over, smooth	9.75 to 10.25
No. 1 dealers' forge	7.75 to 8.25
Mixed borings	3.75 to 4.25
No. 1 busheling	7.75 to 8.25
No. 1 boilers, cut to sheets and rings	6.25 to 6.75
No. 1 cast scrap	8.75 to 9.25
Stove plate and light cast scrap	8.25 to 8.75
Railroad malleable	7.75 to 8.25
Agricultural malleable	7.25 to 7.75
Pipes and flues	6.25 to 6.75
Railroad sheet and tank scrap	5.75 to 6.25
Railroad grate bars	7.25 to 7.75
Machine shop turnings	4.25 to 4.75

Buffalo

BUFFALO, N. Y., January 20, 1914.

Pig Iron.—Approximating 20,000 tons, all grades, have been sold and inquiry aggregating about 25,000 tons is still under negotiation. Reports from foundries in tributary districts say that trade is picking up. The Canadian market is commencing to show enlarged activity. Prices are gradually becoming stiffer although desirable orders are still commanding slight concessions with some makers. As a rule furnacemen are holding firmly to the schedule printed last week which is as follows:

No. 1 foundry	$13.25 to $13.50
No. 2 X foundry	13.00 to 13.25
No. 2 plain	13.00
No. 3 foundry	12.75 to 13.00
Gray forge	12.50 to 12.75
Malleable	13.00 to 13.50
Basic	13.50 to 14.00
Charcoal	15.50 to 16.50
Charcoal, special brands and analysis	17.00 to 19.50

Finished Iron and Steel.—Inquiries and orders for bars and shapes are coming in broadening volume and the demand for plates is also improving. So far as can be learned all low prices and quotations have been withdrawn and the minimum now obtainable is 1.20c. for bars and plates and 1.25c. for shapes. Some contracts for bars extending through second quarter, show an advance of $1 per ton for second quarter specification. With some selling interests an advance of $2 per ton on shapes and plates is asked on second quarter specifications. In tin plate and in wire and wire products orders are holding up well and prices are firm, and in black and galvanized sheets buyers' interest is well maintained and prices have a hardening tendency. Bids are going in to-day for 100 tons steel for a high school building, Depew, N. Y., and plans are under way by the W. S. Brickel Company, architects, Buffalo, for a men's hotel on Niagara square, this city, requiring about 200 tons. Plans are being prepared for a paper warehouse at Syracuse requiring about 400 tons. Chesley, Earl & Heimbach, Buffalo, have sublet 468 tons of structural steel for bridge construction, Barge Canal, to the King Bridge Company, Cleveland.

Old Material.—The market has apparently settled down to a basis of fairly steady demand. Heavy melting steel has advanced 25c. per ton and some good-sized orders have been placed on the basis of $10.25 per ton for ordinary grades and $11 for No. 1 selected heavy steel. Clean cast borings have also advanced 25c. per ton and there is a good demand for this commodity at the advance. The weak item in the list, if any, is railroad and machinery cast scrap, with sales very light, although the price is not quotable lower. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$10.25 to $11.00
Bundled sheet scrap	6.25 to 6.75
No. 1 busheling scrap	8.75 to 9.25
No. 2 busheling scrap	6.00 to 6.50
Low phosphorus steel scrap	15.00 to 15.75
Iron rails	15.00 to 15.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 railroad and machinery cast scrap	12.00 to 12.50
Steel axles	17.00 to 17.50
Iron axles	22.50 to 23.00
Carwheels	11.00 to 11.50
Railroad malleable	10.50 to 11.00
Locomotive grate bars	9.50 to 10.00
Wrought pipe	8.50 to 9.00
Machine shop turnings	5.25 to 5.75
Heavy steel axle turnings	8.25 to 9.00
Clean cast borings	6.00 to 6.50
Stove plate (net ton)	9.75 to 10.00
Bundled tin scrap	12.00

Boston

BOSTON, MASS., January 20, 1914.

Old Material.—Transactions between dealers have resulted in some advances in prices, notably on heavy melting steel, wrought-iron pipe and cast borings. This is an evidence of the general sentiment everywhere. The producers are holding back because of the weather, but more because of the prospect of better prices. The mills have not come into the market to any extent, but the general feeling in the trade is that a period of buying is not far distant. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$8.00 to $8.25
Low phosphorus steel	13.75 to 14.75
Old steel axles	13.25 to 13.75
Old iron axles	21.25 to 21.75
Mixed shafting	12.25 to 12.50
No. 1 wrought and soft steel	9.00 to 9.25
Skeleton (bundled)	6.00 to 6.50
Wrought iron pipe	7.00 to 7.25
Cotton ties (bundled)	7.00 to 7.25
No. 2 light	3.75 to 4.25
Wrought turnings	4.50 to 5.00
Cast borings	5.00 to 5.50
Machinery, cast	11.25 to 11.50
Malleable	8.00 to 8.25
Stove plate	7.75 to 8.00
Grate bars	6.25 to 6.50
Cast-iron carwheels	11.00 to 11.25

The Pierce, Butler & Pierce Mfg. Company, Syracuse, N. Y., was placed in the hands of a Federal receiver last week. Creditors filed a petition asking to have the company adjudged bankrupt, and alleging its inability to pay its debts. The assets were placed at $3,291,242, and liabilities at $1,902,352. The company was founded in 1839 by Sylvester E. Pierce, father of William K. Pierce, who recently withdrew as president. It manufactures house heating apparatus. Arthur W. Leasby was appointed receiver, and the business will continue.

New York

NEW YORK, January 21, 1914.

Pig Iron.—Buying is about at the rate of last week, which could not be called active. An inquiry for 4000 to 6000 tons, delivery in the first quarter, has come up in this market, and there is also one for 2000 tons for a plant in the Central West, for which the buying is done in New York. Otherwise inquiries are for small or moderate lots. There is some uncertainty as to the basis on which business could be done at Buffalo, though it would appear from New England advices that $13 is not the Buffalo minimum. There are indications that $12.50 could be done for No. 2 X. Virginia iron has figured in only a small way in recent Eastern sales. Some furnaces there are asking $13 for No. 2 X but $12.75 would be done by others for first quarter, and in one case that price is available on shipments extending over the first half. Eastern Pennsylvania prices still show quite a little variation. As low as $13 at Lebanon Valley furnace has been named for No. 2 X, and in the Lehigh Valley one interest recently quoted $13.30. Other producers asked 25 to 50 cents higher. Shipments are proceeding with fair regularity, there being only occasional hold-ups by consumers. Two failures in New York State indicate something of the strain under which some foundries have operated. In both cases there was shown to be considerable indebtedness to Buffalo furnace companies. Foundries in New Jersey district are running rather better after the holiday quiet, but operations in New England territory are still restricted. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $14.75 to $15; No. 2 X, $14.25 to $14.75; No. 2 plain, $14 to $14.25. Southern iron is quoted at $15 to $15.25 for No. 1 and $14.75 to $15 for No. 2.

Finished Iron and Steel.—Without doubt the improvement that has prevailed since the first of the year continues. As to an increase in business, the situation is one that makes for optimism rather than the contrary, for while inquiries continue active, actual orders are of such a nature and size that most sellers are satisfied. It is the prevailing and firm purpose of most producers not to contract beyond the first quarter except at an advance of from $1 to $2 per ton, no matter how urgently pressed. On the other hand, many of the buyers while naturally ready to contract for six months or more at present levels are only purchasing for their present requirements, which are more than for some time, or are contracting for the first quarter. The principal feature of the week's business is the awarding of pending contracts for structural material aggregating nearly 40,000 tons when the miscellaneous small jobs are counted. This tonnage is distributed as follows: 14,500 tons for elevated extensions, New York Municipal Railways, awarded to the Phoenix Iron Company; 7000 tons for a building for the National Cloak & Suit Company, New York, to the Hay Foundry & Iron Works; 6000 tons for the Wilkes-Barre Connecting Railway, for the Delaware & Hudson and Pennsylvania Railroad, to the Pennsylvania Steel Company; 1200 tons for a building for the Empire Life Insurance Company, Augusta, Ga., to Levering & Garrigues, and 5700 tons for the Seventh avenue subway to the American Bridge Company. New propositions before the market embrace 600 tons for the Strathcona apartments, 155th street and Riverside drive, bids for which are already in; 100 tons for a bridge for the Central & New England Railroad and 700 tons for two bridges for the city of Springfield, Mass., bids for which go in January 29. The race track grandstand at Havre de Grace, Md., reported last week as having been awarded to the Pennsylvania Steel Company, went to the Phoenix Iron Company. The Illinois Central Railroad is reported to have ordered 150 refrigerating cars from the American Car & Foundry Company, and the Union Tank Line is in the market for 500 steel tank cars and the Wheeling & Lake Erie for 200 cabooses. We quote mill shipments of steel bars at 1.20c., Pittsburgh, or 1.36c., New York; plates and plain structural material at 1.20c. to 1.25c., Pittsburgh, or 1.36c. to 1.41c., New York; iron bars, 1.25c. to 1.35c., New York. We quote iron and steel bars from store, 1.90c. to 1.95c., and shapes and plates 1.95c. to 2c.

Ferroalloys.—It is reported that the domestic producer of ferromanganese is selling considerable of its product very quietly, but definite details are lacking. It is understood, however, that the price at which this is being marketed is $45, Pittsburgh, while the quotation of the foreign producers is $45, seaboard, with the possibility that this can be shaded. Outside of these reported transactions, sales in this district are confined to small lots. Ferrosilicon continues quiet, with prices quoted at $73 for carloads, $72 for 100 tons, and $71 for 600 tons or over.

Cast-Iron Pipe.—Municipal lettings are increasing. Brookline, Mass., will open bids January 27, on 230 tons; Schenectady, N. Y., January 28, on 130 tons; New Bedford, Mass., January 29, on 1050 tons; the Department of Water Supply, Gas and Electricity, New York, January 29, 500 tons. Los Angeles, Cal., will open bids January 27 on 2500 tons of 6 to 30 in. A great deal of private inquiry is reported, and the feeling in the trade steadily grows better. Carload lots of 6 in. are quoted at $22 to $23, per net ton, tidewater.

Old Material.—Large dealers have apparently concluded that as better times are to be expected it may be possible to work prices to a higher level. They have succeeded in imbuing others in the trade with their ideas to such an extent that it is now quite difficult if not impossible to secure material at recent prices. Dealers' quotations are as follows, per gross ton, New York:

Old girder and T rails for melting	$8.50 to $9.00
Heavy melting steel scrap	8.50 to 9.00
Relaying rails	21.00 to 21.50
Rerolling rails	10.50 to 11.00
Iron car axles	19.00 to 19.50
Steel car axles	13.00 to 13.50
No. 1 railroad wrought	11.00 to 11.50
Wrought-iron track scrap	9.50 to 10.00
No. 1 yard wrought, long	9.00 to 9.50
No. 1 yard wrought, short	8.25 to 8.75
Light iron	3.50 to 4.00
Cast borings	5.50 to 6.00
Wrought turnings	5.25 to 5.75
Wrought pipe	7.25 to 7.75
Carwheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.00 to 8.50
Locomotive grate bars	7.00 to 7.50
Malleable cast	7.50 to 8.00

Metal Market

NEW YORK, January 21, 1914.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Jan.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
15	14.50	14.12½	36.90	4.10	3.97½	5.25	5.10
16	14.62½	14.25	37.05	4.10	3.97½	5.25	5.10
17	14.62½	14.25	37.00	4.10	3.97½	5.25	5.10
19	14.75	14.37½	37.45	4.10	3.97½	5.25	5.10
20	14.75	14.37½	37.75	4.10	3.97½	5.25	5.10
21	14.75	14.37½	37.85	4.10	3.97½	5.25	5.10

Copper is somewhat more active and prices have advanced. In tin there have been flurries of buying and the metal is higher. Lead is unchanged, though there is good inquiry. Spelter is steady at unchanged prices. The weak tone of antimony continues.

New York

Copper.—A better tone pervades the market, although there has been no extremely heavy business. Europe has been a good buyer of electrolytic and domestic consumers took more than they have in recent weeks. Prices advanced and the quotation for electrolytic to-day is 14.37½c. Lake is nominal at 14.75c. to 15c., cash. An actual selling price for Lake is very difficult to locate, even prominent producers declining to quote. The advance in electrolytic was brought about by sellers and not supported by buying to the extent which is usual, but the trade feels that there should be buying in the near future. In London, spot is quoted to-day at £64 13s. 9d. and future at £65. The exports this month total 20,415 tons.

Tin.—Late on Wednesday of last week about 150 tons were sold, mostly spot, and on consumers' account. The following day about 250 tons were sold at close prices for deliveries that were scattered all the way from spot to June. A good part of this latter business was between dealers. Since Thursday there has been little business, although there has been a good volume of inquiries which are still pending. On Monday prices unexpectedly advanced in London, the reason developing on Tuesday, when it was learned that there was a lack of sellers both at Singapore and Penang and subsequently at London. There is some belief that the course of the London market is being shaped to influence the auction sale of Banca tin, which takes place in Holland next Wednesday. The New York quotation to-day is 37.85c., which is an advance of over 1c. compared with the price of a week ago. The quotations in London to-day are £172 15s. for spot and £174 5s. for future. The arrivals this month total 2100 tons and there is afloat 2195 tons.

Lead.—Quotations are strong at 4.10c., New York, and 3.97½c., St. Louis. Late last week the market was dull in every particular, but the situation in England, where spot lead is selling at a premium because of a shortage there, has given a much firmer tone to the market here. On Monday there was good inquiry from consumers, who evidently thought that prices would advance, but it did not culminate in business equal to the amount of inquiry. Some of the latter came from abroad, but the New York price is not low enough to permit of foreign shipments, although the margin is not great as lead could be exported to-day at 3.95c., f.o.b. New York, which is but 15 points below the prevailing quotation. So far American producers have shown no desire to export their metal.

Spelter.—This metal is steady though not especially active at 5.25c. to 5.30c., New York, and 5.10c. to 5.15c., St. Louis. The most promising feature of the market is the better activity in the production of sheets, which must ultimately better the demand for spelter.

Antimony.—The market continues easy and quotations are soft at 7c. to 7.12½c. for Hallett's, 7.30c. to 7.40c. for Cookson's and 6c. to 6.50c. for Chinese and Hungarian grades. The government's statistics show that the importations of antimony fell off heavily in the latter part of 1913 and all the indications point to a liquidation of the heavy stocks which had been accumulated.

Old Metals.—The volume of business is small. Dealers' selling prices are unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	13.75 to 14.00
Copper, heavy and wire	13.25 to 13.50
Copper, light and bottoms	12.25 to 12.50
Brass, heavy	8.50 to 8.75
Brass, light	7.50 to 7.75
Heavy machine composition	11.75 to 12.00
Clean brass turnings	8.00 to 8.25
Composition turnings	10.75 to 11.50
Lead, heavy	3.90
Lead, tea	3.65
Zinc, scrap	4.10

Chicago

JANUARY 19.—A slight reaction at the end of the week failed to dispel the depressing atmosphere in the metal market, more particularly with respect to copper. Quotations were largely nominal. Reports of concessions, at least the more extreme, are thought to have reflected bid prices rather than transactions. Tin displayed a flash of strength. We quote as follows: Casting copper, 14.50c.; Lake copper, 15c., for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 38.25c.; small lots, 40.25c.; lead, desilverized, 4.05c., and corroding, 4.35c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c.; Cookson's antimony, 9.50c.; other grades, 8c.; sheet zinc, $7.50 f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 11.50c.; copper bottoms, 10.25c.; copper clips, 11c.; red brass, 10.75c.; yellow brass, 8c.; lead pipe, 3.50c.; zinc, 3.75c.; pewter, No. 1, 23c.; tin foil, 28c.; block tin pipe, 31c.

St. Louis

JANUARY 19.—There has been a recession in prices, with the close to-day rather dull for the most part. Quotations are: Lead, 3.97½c.; spelter, at 5.10c.; tin, 37.60c. to 37.95c.; Lake copper, 15.35c.; electrolytic copper, 14.75c. to 14.85c.; Cookson's antimony, 7.8c. to 7.95c. In the Joplin ore district, prices for zinc blende were somewhat weaker, with the basis range from $38 to $41 per ton for 60 per cent., with the top settlement at $44. This makes the general tone of the market about $1 below the preceding week. Calamine ranged from $19 to $21 for 40 per cent., with the top settlement at $24. Lead ore was steady and brought $50, unchanged, for 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 4.50c.; heavy yellow brass, 7c.; heavy red brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 2.75c.; lead, 3c.; pewter, 22c.; tinfoil, 27c.; tea lead, 2.75c.

Iron and Industrial Stocks

NEW YORK, January 21, 1914.

The rise in security values, which has been in progress for some time, almost reached a state of buoyancy in the past week. Sharp advances occurred all along the line. Business interests are taking heart from the cautious utterances of national authorities, which are in sharp contrast with the rasping deliverances that were so unpleasantly common a few years ago. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	9½ - 11¼	Pittsburgh Steel, pref.	92
Allis-Chal., pref.	43½ - 47	Pressed St'l, com.	31¾ - 32
Am. Can, com.	31¾ - 34⅜	Pressed St'l, pref.	97¾ - 100
Am. Can, pref.	93 - 95½	Ry. Spring, com.	27 - 28¾
Am. Car & Fdry., com.	46¼ - 48	Ry. Spring, pref.	97
Am. Car & Fdry., pref.	114 - 114⅝	Republic, com.	22½ - 24¼
Am. Loco., com.	31 - 35¼	Republic, pref.	83 - 87
Am. Loco., pref.	97½ - 99½	Rumely Co., com.	15¾ - 18
Am. Steel Fdries.	31½ - 33⅞	Rumely Co., pref.	36¼ - 40
Bald. Loco., com.	40¼ - 43¼	Sloss, com.	29 - 32
Bald. Loco., pref.	102½ - 104	Sloss, pref.	90
Beth. Steel, com.	33½ - 36⅝	Pipe ,com.	11¾ - 12
Beth. Steel, pref.	71 - 76¾	U. S. Steel, com.	59¾ - 62⅞
Case (J. I.), pref.	94½ - 95	U. S. Steel, pref.	108½ - 109⅝
Colorado Fuel	31⅞ - 32⅜	Va. I. C. & Coke	40
Deere & Co., pref.	96⅝	Westingh'se Elec.	66¾ - 68¾
General Electric	143 - 146	Am. Ship, com.	34
Gt. N. Ore Cert.	36¼ - 39¼	Am. Ship, pref.	81½ - 83
Int. Harv., com.	105 - 109½	Chic. Pneu. Tool.	52½ - 54½
Int. Harv., pref.	116	Cambria Steel	48¾ - 50¾
Int. Harv., Corp.	105 - 108	Lake Sup. Corp.	21 - 22⅝
Int. Harv. Corp., pref.	116	Pa. Steel, pref.	60 - 62⅝
Int. Pump, com.	6¾ - 9⅞	Warwick	16⅞
Int. Pump, pref.	19¾ - 29	Cruc. Steel, com.	15 - 15¾
Lackawanna Steel	34	Cruc. Steel, pref.	91½ - 92¾
Nat. Enam. & St., com.	12 - 13½	La Belle Iron, com.	43 - 45¾

Dividends Declared

The American Shipbuilding Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 15.

The Cambria Steel Company, regular quarterly, 1¼ per cent., payable February 14.

The Dominion Steel Corporation, regular quarterly, 1½ per cent. on the preferred stock, payable February 2.

The Emerson-Brantingham Company, regular quarterly, 1¾ per cent. on the preferred stock, payable February 1.

The Willys-Overland Company, regular quarterly, 1½ per cent. on the common stock, payable February 2.

The Pressed Steel Car Company, regular quarterly, 1¾ per cent. on the preferred stock, payable February 25.

The Bethlehem Steel Corporation, 5 per cent. on the preferred stock for 1914 out of earnings in 1913, payable in quarterly instalments of 1¼ per cent. on April 1, July 1 and October 1, 1914, and January 1, 1915. A similar dividend was declared a year ago.

Corrigan, McKinney & Co., Cleveland, Ohio, have placed a contract with the Westinghouse Electric & Mfg. Company for the complete mill motor equipment for their new steel plant. Specifications for this equipment have not yet been completed.

Pittsburgh and Valleys Business Notes

The West Penn Steel Company, Brackenridge, Pa., manufacturer of black and galvanized sheets, will make some extensive additions to its plant. These include a 100-ton open-hearth furnace, a four-hole soaking pit, a 20-ton crane and crane runway, and steel bins for the scrap yard. This company now has two 100-ton open-hearth furnaces, making about 7000 tons of sheet bars per month, of which about 5500 tons are used in its sheet mills and 1500 tons are sold in the open market. The new open-hearth furnace is expected to add a capacity of 3500 tons per month more sheet bars, all of which will be sold in the open market. The new furnace will be built by William Swindell & Brother, Pittsburgh, who built the two furnaces now in use.

The William B. Scaife & Sons Company, Pittsburgh, has received a contract from the Pittsburgh Coal Company for three steel tipples, which will require a large tonnage of structural steel work.

John L. Mullen, contracting engineer, Pittsburgh, will erect the steel work for the new Masonic Temple to be built in that city. The structure will be 97 x 198 ft., six stories. The steel work, which will be unusually heavy for a building of this size, is being fabricated by the American Bridge Company.

The National Roll & Foundry Company, Farmers' Bank Building, Pittsburgh, has received a contract from the Follansbee Brothers Company for the installation of Baird water-cooled floor plates to cover standings at 10 of its hot sheet and tin mills at the works at Follansbee, W. Va. Some time ago the Roll & Foundry Company installed this type of standing at two of the hot mills in the plant, and the results were so satisfactory that this contract has been placed for the other 10 mills. Working conditions were improved, and the output of the two mills was increased. A description of this standing appeared in *The Iron Age* of January 8.

The plant of the Darlington Foundry Company at Darlington, Pa., which has been idle for some time, has been taken over by a new company, composed of Pittsburgh and Beaver parties, and will be known as the Darlington Steel Castings Company, which has been formed with a capital stock of $100,000. Improvements and repairs will be made and the plant will shortly be started. It is equipped for the manufacture of steel castings. The incorporators are A. P. Dysart and G. P. Steel of Pittsburgh, A. L. Mitchell of Beaver, and H. W. Reeves and C. R. May of Beaver Falls.

The Clark Car Company, Oliver Building, Pittsburgh, has made an arrangement with the Youngstown Car & Mfg. Company, Youngstown, Ohio, by which it will take the entire output of the Youngstown works for a period of five years, comprising annually 800 to 1000 standard steel cars. The Youngstown plant will be operated largely in the manufacture of the Clark extension low-bottom car, used largely for yard service around industrial plants, and in connection with steam shovel operations. The Youngstown Car & Mfg. Company does not lose its identity under this arrangement.

This week the Farrell works of the Carnegie Steel Company at Farrell, Pa., is being operated to nearly full capacity. One blast furnace is in operation, 10 of the open-hearth furnaces, the blooming and plate mills and all the by-product coke ovens.

The puddling plant at Girard, Ohio, of the A. M. Byers Company, Pittsburgh, has been put in operation as an open shop. It contains 88 puddling furnaces, being one of the largest in the Middle West, and had been idle since last July on account of the refusal of the company to sign the Sons of Vulcan scale. This company also operates a plant in Pittsburgh, containing 29 puddling furnaces, which has also been running open shop for several weeks. All the iron made by the company in its two puddling plants is used in the manufacture of Byers wrought-iron pipe.

In regard to the report that the Westinghouse Electric & Mfg. Company, East Pittsburgh, had laid off 2000 salaried employees and had reduced wages 16 2-3 per cent., Guy E. Tripp, chairman of the board, has made the following statement: "There has been no salary reduction and none is in contemplation, except that which has been brought about by putting the factory force on 45 hours per week instead of 54 hours per week."

The three skelp mills of the Youngstown Sheet & Tube Company at East Youngstown, Ohio, are in full operation, after being idle several weeks. Its 16 sheet mills are also in full operation this week. On Wednesday, January 14, the three blast furnaces of this company at East Youngstown made a total of 1607 tons of pig iron. The fourth stack is idle.

W. J. Rainey, the largest independent manufacturer of Connellsville coke, has abandoned 18 ovens at Elm Grove, 10 at Fort Hill and 25 at Paul, reducing the total number operated by this interest by 53.

E. P. Kennedy, Pittsburgh, has been appointed receiver of the United States Safe Company, Elizabeth, Pa. It is stated that the assets of the company exceed the liabilities by $100,000, but that it has not enough ready money to meet the demands of its business.

The Riverside Works of the National Tube Company at Wheeling, W. Va., which has been idle for some time, resumed operations last week to nearly full capacity.

The annual meeting of stockholders of Spang, Chalfant & Co., Inc., Pittsburgh, was held January 20. Officers were re-elected as follows: Henry Chalfant, president; D. B. McClelland, vice-president and treasurer; A. M. Bell, secretary, and George Matheson, Jr., assistant treasurer. Directors, C. H. Spang, Henry Chalfant, D. E. Park, D. B. McClelland and A. M. Bell.

The J. H. Hillman & Sons Company, Oliver Building, Pittsburgh, has reduced coke workers' wages about 10 per cent. at its Griffin No. 1 and No. 2 works near Masontown, Pa. The new scale is practically the same as that in force prior to the advance made in 1911, which averaged about 10 per cent. Slight wage readjustments have been made at several other works of this company.

The second annual dinner of the office force and department heads of the Brier Hill Steel Company was held in the new Hotel Ohio, Youngstown, on the evening of January 19. Joseph G. Butler, Jr., vice-president of the company, was toastmaster.

Projectile Contracts Awarded

Contracts for $1,917,340 worth of armor piercing and common projectiles were placed January 16 by Secretary of the Navy Daniels. The awards were:

Foruteen-in. armor piercers—Crucible Steel Company, 1200, at $378,000; Bethlehem Steel Company, 2400, at $768,000, and Midvale Steel Company, 600, at $200,400.

Twelve-in. armor piercers—Midvale Steel Company, 1800, at $297,000.

Five-in. common projectiles—Bethlehem Steel Company, 18,000, at $156,960; E. W. Bliss Company, 6000, at $51,360.

Four-in. common projectiles—Bethlehem Steel Company, 1200, at $65,620.

Awards were to more than one concern in some cases, because none of the companies bid for the full number required.

Dr. Moldenke Resigns Secretaryship

Dr. Richard Moldenke has resigned as secretary of the American Foundrymen's Association. The resignation was tendered partly owing to Dr. Moldenke's desire to be relieved of duties which have been an increasing burden to him and partly because of a change in the policy of the association regarding meetings which he believes is impending and with which he is not altogether in accord. He offered, however, to continue to assist in matters in which he has conspicuously helped the association, and he will as heretofore, for example, edit the proceedings. This arrangement was effected and the resignation was accepted at a meeting of the executive committee of the association, held in Chicago January 17.

Personal

Joseph R. Poe, formerly structural engineer of the Wellman-Seaver-Morgan Company, Cleveland, Ohio, has opened an office as consulting engineer under the name of the Poe Engineering Company at 866 Rockefeller Building in that city.

Thomas C. Keeling has been made general manager of the Nashville Machine Company, Nashville, Tenn. The company manufactures electric elevators.

C. F. Edwards, assistant general superintendent of the Milwaukee works of the International Harvester Company, who has resigned to become general master mechanic for the M. Rumely Company, at LaPorte, Ind., was tendered a banquet by department heads of the Milwaukee works. He was presented with a gold watch, a Masonic charm and a traveling bag.

S. Wolff has been appointed Chicago manager for the DeLaval Steam Turbine Company, with offices in the Peoples Gas Building. He was formerly identified with the Allis-Chalmers Mfg. Company, and was manager of its Cleveland office.

Charles McKnight, president of the Carbon Steel Company and president of the Western National Bank, Pittsburgh, has been re-elected president of the Pittsburgh Clearing House Association.

H. B. N. Douthitt, formerly manager of mines on the Monongahela River for the Pittsburgh Coal Company, has resigned to become general superintendent of the Vesta Coal Company, owned by the Jones & Laughlin Steel Company of Pittsburgh, with mines at California, Pa. He succeeds E. B. Drum, who retires after an active service of more than 25 years. Harry R. Miller, who has been inspector of the mines of the Pittsburgh Coal Company on the Monongahela River, succeeds to the position vacated by Mr. Douthitt. A complimentary dinner was tendered Mr. Douthitt last week by officials and superintendents of the Pittsburgh Coal Company.

John R. McCune, Pittsburgh, has been elected a director of the Westinghouse Electric & Mfg. Company, succeeding J. S. Kuhn, and Paul D. Cravath has been elected a director to succeed A. M. Brady, deceased. One vacancy still exists on the board of this company caused by the recent resignation of T. W. Lamont of J. P. Morgan & Co.

George F. Maddock has been appointed manager of the department of examinations and reports of H. M. Byllesby & Co., engineers, Insurance Exchange Building, Chicago.

W. P. Pilling, Pilling & Crane, Philadelphia, Pa., left January 17 for a three weeks' vacation at Ormond, Florida.

Robert H. Reidenbaugh has resigned as secretary and purchasing agent of the Marion Steam Shovel Company, Marion, Ohio.

Nathan Owitz, manager, Wheeler Condenser & Engineering Company, at Cincinnati, Ohio, has been appointed Pittsburgh manager of the same company. Victor T. Price, formerly public service director of Cincinnati, will have charge of the office in that city.

Charles H. Domhoff, Domhoff & Joyce Company, Cincinnati, Ohio, is spending the winter at his home in southern California.

Charles R. Hook, general superintendent, American Rolling Mill Company, Middletown, Ohio, has returned from a wedding tour in Europe.

Ellis F. Muther, New York manager Gisholt Machine Company, 50 Church street, was operated on January 17 for appendicitis. He is in a hospital at Orange, N. J.

J. A. Miller, Jr., formerly representative for the Pennsylvania Steel Company at the City of Mexico, has been transferred to the Chicago office of the company.

George R. Reel, associated with the Chicago sales office of the Pennsylvania Steel Company, has resigned to take up other work.

Capt. Robert W. Hunt delivered an illustrated lecture on "Steel Rails" Wednesday evening, January 14, to the employees of Robert W. Hunt & Co. living in the vicinity of Chicago. The invitations included the wives and families of the employees. The lecture was given in the rooms of the Western Society of Engineers and more than 250 people availed themselves of the privilege.

C. R. McCullough, who has been connected with the Detroit office of Manning, Maxwell & Moore, Inc., for the past two years, has entered the employ of the Lees-Bradner Company, Cleveland.

Charles A. Schieren, chairman of the executive committee of the Charles A. Schieren Company, New York, is seriously ill at his home in Brooklyn, N. Y.

Obituary

LORD STRATHCONA and MOUNT ROYAL (Donald Smith) died in London, England, January 21, aged 93 years. Born in Scotland, he went to Canada with the Hudson Bay Company in 1838 and continued in its service for 30 years. He then entered the first Manitoba Legislature and was next sent to the Canadian Parliament at Ottawa. In 1880 he formed a syndicate with George Stephen and others and took a prominent part in the construction of the Canadian Pacific Railway from Montreal to the Pacific coast. He soon became one of the leading men in the Dominion of Canada and was the recipient of numerous honors and distinctions.

CHARLES HAWLEY CORBETT, vice-president of the Continental Iron Works, died January 14, at his home in Brooklyn, N. Y. He leaves a widow and a son.

The annual gathering of the salesmen of the Carpenter Steel Works, Reading, Pa., last week, closed with an annual banquet to the salesmen and heads of the different departments of the plant. Robert E. Jennings, president of the company, acted as toastmaster, and responses to toasts were made as follows: "The Carpenter Steel Company," W. B. Kunhardt; "Woes of the Steel Salesman," J. E. Sullivan, general sales manager; "The Wild and Woolly West," F. A. Bigelow, western sales manager; "The Man Behind the Gun," J. H. Parker, metallurgist, and "The Return of the Minstrel," W. B. Sullivan.

The Utica Pipe Foundry Company, Utica, N. Y., filed a voluntary petition in bankruptcy January 17. The liabilities are slightly more than $400,000, while assets are listed at $958,000. The failure of the company, which in years past has earned 8 per cent on its stock, is said to be due chiefly to business stagnation and the fact that the company had recently experienced difficulty in securing money to tide it over financial troubles.

The annual meeting of the Marting Iron & Steel Company was held at the company's offices, at Ironton, Ohio, on January 14. The following officers and directors were elected: H. A. Marting, president; E. O. Marting, secretary. Directors, H. A. Marting, E. O. Marting, W. W. Marting, James Albert Green, A. H. Mittendorf, Dr. A. C. Lowry, F. L. McCauley and D. C. Davies.

The Rateau steam regenerator patents have been sustained by the United States District Court for the southern district of New York, in a decision rendered January 14, 1914. Suit was brought by the Rateau Steam Regenerator Company against the American Regenerator Company, and Rateau patents Nos. 679,242 and 12,295 were held to be valid and infringed.

The employees of the New York office of Joseph T. Ryerson & Son held their annual dinner January 10 at the Hotel McAlpin. The occasion was informal.

THE STEEL CORPORATION SUIT

Hearings Continued in the South — Testimony Taken at Birmingham and New Orleans

The hearing at Birmingham, Ala., in the suit for the dissolution of the United States Steel Corporation was continued on Monday, January 12.

Walker L. Wellford, secretary and treasurer of the Chickasaw Cooperage Company, Memphis, Tenn., testified that his company uses steel hoops in the manufacture of barrels. These hoops are bought on a competitive basis, bids being received from over a dozen steel companies. He said he purchased from 25,000 to 45,000 tons of steel hoops per year, his company being one of the largest buyers of hoops in the country. He said that all of the firms that made bids solicited his business.

He stated that most of the hoops had been purchased from the Sharon Steel Hoop Company in the past 10 or 12 years, due partly to the fact that its former sales manager was an intimate friend and that he thought it well to patronize an independent concern. As to prices, he said that fluctuations were much greater in former years than now.

THE TENNESSEE MERGER STRONGLY DEFENDED

George W. Connors, president Connors-Weyman Steel Company, Birmingham, testified that his company is a manufacturer of steel hoops, buying the necessary steel billets in the open market. He finds competition for his business among the steel makers very active. The Tennessee Coal, Iron & Railroad Company and the Gulf States Steel Company are among those who quote him prices on billets. Since starting in business in Birmingham, in 1908, he has bought all his billets from companies outside of the Steel Corporation. Mr. Connors said:

Our market is in all the Southern cotton States and we have competition as active as can be everywhere. I have never considered the Steel Corporation an unfair competitor. It has never resorted to underhand methods, so far as I have known. I regard the consolidation of the Steel Corporation and the Tennessee Coal, Iron & Railroad Company as a great benefit to the Birmingham district. This union has not affected anyone I ever heard of in an unfavorable way. I would deem the separation of the Tennessee Company from the Steel Corporation a misfortune.

On cross-examination he said:

The Tennessee Company has had a fixed policy under the United States Steel Corporation and has treated its competitors in a broad way. Southern manufacturers of steel billets would materially feel this dissolution very keenly. The Gulf States Steel Company, the Atlanta Steel Company and other concerns south of the Ohio River would be damaged if the large operations of that company were to cease. These large operations demand an enormous amount of steel products and have only been in activity since the Steel Corporation has been giving the Tennessee Company the money. It is a question of money. But the Tennessee Company was never able to get any of these millions until the Steel Corporation acquired it. To stop the development undertaken here by the corporation would hurt the manufacturers, the merchants, the entire district, and the South.

Mr. Connors was cross-examined at some length regarding purchases of billets when he was connected with the Atlanta Steel Company, Atlanta, Ga., prior to his engaging in business in Birmingham. He said that at that time he found competition among steel manufacturers keen, with prices varying. In 1906 about 80 per cent. of the billets purchased by the Atlanta Steel Company was bought from competitors of the Steel Corporation. In 1903 and 1904 he had heard of an agreement among the billet makers, but he was always able to beat the alleged pool price.

HARDWARE MERCHANTS TESTIFY ON COMPETITION

Two wholesale hardware merchants of Birmingham also gave testimony, namely, James D. Moore, Moore-Handley Hardware Company, and Rush Simpson, Wimberly & Thomas Hardware Company. Both gave details of their methods of purchasing and both testified that they found active competition among manufacturers from whom they bought. Mr. Moore said that his company bought about 45 per cent. of its wire products from the American Steel & Wire Company. In answer to a direct question, he said that he regarded the purchase of the Tennessee Company by the Steel Corporation as a benefit to consumers of steel products in the South rather than a disadvantage.

On closing the hearing at Birmingham on January 12, announcement was made that the next hearing would be on the following day at New Orleans.

WITNESSES EXAMINED AT NEW ORLEANS

The hearing at New Orleans began on Tuesday afternoon, January 13. J. W. Porch, resident manager for the Lukens Iron & Steel Company, operating an iron and steel warehouse, testified that the competition of the Steel Corporation was always fair; that he had not found it otherwise. He further declared that he had found free competition for the business offered by his company, and asserted that he always called for bids, and contracts were made at the lowest figures in the open market, which at times varied considerably from those of the corporation subsidiaries. He said also that he had recently purchased steel in Germany for his company, it being cheaper there than here.

W. P. Simpson, secretary of the C. T. Patterson Company, New Orleans, testified that of the wire nails he buys during the year about 50 per cent. comes from the corporation. Twenty-five per cent. of the sheet steel his firm consumes comes from it and one-third of the steel pipe used is bought from the same source. He gave a long list of competitors for the business of his concern and asserted that the independents cut prices in slack times in the fierceness of the competition and that just now this rivalry is "extremely active." He said that he would like, personally, to do more business with the corporation subsidiaries, but that he is unable to give rein to his feelings in this direction as the prices they are compelled to quote him are not as low as those quoted by certain of the independents he named.

On Wednesday the first witness was R. G. Wilder, Norvell-Wilder Hardware Company, Beaumont, Tex. The most important statement he made was that his company had at times favored the purchase of some products in which it dealt from the corporation rather than from the independents, although the prices offered by the latter might be lower. He explained that at times this was done because the corporation maintained warehouses at Galveston and Texas City, and he was able to take advantage of the stocks kept there. He referred to the Gulf States Steel Company as the "fourth generation" of the old Alabama Steel & Wire Company. On being asked to explain his meaning he said that the company had been forced to reorganize three times.

Albert S. White, president New Orleans Roofing & Metal Works, testified that he had been unable to see any symptoms of monopoly or lack of keen competition in his business and for his business. He bought close, he said, because he had to sell close.

(Continued on page 298)

The Machinery Markets

Buying of machinery has not been increased to any appreciable extent, but the confidence of the trade has been stimulated by a general betterment in the volume of inquiries. In New York considerable business is promised for the spring, while at present there is fair activity in second-hand machinery. Enough orders are being received in New England to indicate that the turning point has been reached and confidence is correspondingly greater. New business is coming out sparingly in Philadelphia, although the makers of smaller special equipment are fairly busy. The improved feeling continues in Cleveland, although the orders are mostly for single tools and of moderate volume. Cincinnati has felt a general improvement in the number of inquiries and most of the shippers there believe that substantial betterment would follow an increase in railroad freight rates. Detroit is slightly more active with more prospective business coming out, though sales cannot be called numerous. Conditions are bettering slowly in Milwaukee, where it is felt that full activity largely depends on the railroads. Boilers, engines and electric motors are in better call in the Central South and the better tone continues. A better outlook has accentuated a cheerful feeling in St. Louis. The outlook in Birmingham is better than it has been since last fall. Texas conditions show an improvement, with an especially good demand for ice machinery. The near future has a favorable aspect in the Pacific Northwest, although Puget Sound industrial conditions are hampered by strikes at the Tacoma Smelting Company and the Pacific Steel Company. In the San Francisco territory there is plenty of work in sight for the spring and summer and it is expected that conditions will improve slowly.

New York

NEW YORK, January 21, 1914.

Beyond a slight improvement in the volume of inquiries and fair activity in second-hand machinery there is but little betterment in the local market. A good part of the inquiry for new equipment is tentative and will not result in business until spring, according to the statements of the firms interested. A healthy symptom of the last week is a slightly better inquiry from railroads for special shop equipment for which there is actual need. The trade generally still holds to the belief that conditions will improve slowly. Salesmen representing machine tool houses are disappointed with the failure of some companies in this territory to take advantage of the present dullness as an opportunity to place their production facilities on a more economical basis. To some it has been pointed out that they are not manufacturing but building, when they should be doing the former, and that the expenditure of comparatively small amounts of money would increase their output and lessen the individual cost of the machine or article they produce. Several firms are seriously looking into this phase of the subject and preparing to spend money as soon as details are worked out. On the other hand, there are firms which admit that changing conditions will ultimately compel many readjustments in their shops, yet they plead that orders are few, money not over-plentiful and that they will wait until business picks up before making the suggested improvements. They admit, in some instance, that the actual cost of their product is greater per unit than it would be when made under revised methods, some of which are pointed out to them.

The business of the Mechanical Handler Company, Hudson, N. Y., amounting to about $12,000, has been placed. The company makes ice handling machinery.

Fred A. Phelps, engineer and architect, Union Building, Newark, N. J., is in the market for a tandem-compound left-hand Corliss engine, 800 to 1000 hp., to operate under 120 lb. of steam and condensing.

The Ford Motor Company plans to erect an eight-story structure on Jackson avenue, Long Island City, N. Y., having a frontage of 325 ft. and a depth of 225 ft. It is estimated to cost $500,000. This will more than double the size of the present plant of the company.

The Empire Art Metal Company, College Point, N. Y., has completed its large new plant and has received the contract for the steel doors and interior trim for the Equitable Building, New York City. John W. Rapp is president of the company.

The Walder, Croshier, Sullivan Company, Poughkeepsie, N. Y., has been incorporated with a capital stock of $51,000, to manufacture hardware supplies, patented articles, etc. The incorporators are R. B. Croshier, Wappingers Falls; I. J. Walder and J. D. Sullivan, Poughkeepsie.

The Electrical Safety Devices Mfg. Company, Albany, has been incorporated with a capital stock of $20,000 by Horace E. Nichols, of Schenectady; William Addison and Smith O'Brien, of Albany.

The Lineatime Mfg. Company, Rochester, N. Y., which will manufacture office supplies, copy holders, etc., has been incorporated with a capital stock of $50,000 by C. R. Drak, E. M. Thaney and W. A. Wright, Rochester. Arrangements are being made for the equipment of a manufacturing plant.

Baird Brothers, Amsterdam, N. Y., have let the contract for the erection of a three-story and basement light manufacturing and storage building.

The Ogdensburg Machine Company, Ogdensburg, N. Y., recently incorporated, has taken over the property of Nash Brothers & Co. It will manufacture a steam steering gear, a wire-rope compressor used by vessels in canals for snubbing purposes, syphons and grease cups. It will engage in repair work, especially marine repairing, and will carry a stock of engineering supplies. D. C. Culver is president; Herbert H. Saunders, general manager, and Edward P. Carmody, secretary.

The Ferguson Steel & Iron Company, Buffalo, has completed plans for a steel frame addition to its fabricating plant.

The Gerhard-Rowley Hydro-Carbon Vaporizing Company, Buffalo, has been incorporated and will manufacture vaporizers for internal combustion engines for use on automobiles, auto trucks, etc. For the present the company will have the vaporizers made under contract, establishing a factory later. The company is capitalized at $100,000. Lawrence C. Gerhard is president; James M. Rowley, treasurer; Joseph F. Rowley, 298 West avenue, Buffalo, secretary.

Catalogues Wanted

The Remington Typewriter Company announces that hereafter purchases will be made at the office of L. Rayburn, buyer, 114 Gifford street, Syracuse, N. Y., for the Remington Typewriter Works, Ilion, N. Y.; Smith Premier Works, and Monarch Typewriter Works, Syracuse, N. Y., and Yost Typewriter Works, Bridgeport, Conn. Correspondence relating to buying is to be addressed to the Remington Typewriter Company, factory buying office, at the above address. Invoices and correspondence regarding payments are to be mailed to the works to which shipments are made. It is asked that copies of late catalogues be sent to the new office.

Harold M. Bush, engineer, 136 East Gay street, Columbus, Ohio, desires to receive catalogues with which to replace his file, recently destroyed by fire.

New England

BOSTON, MASS., January 20, 1914.

Various signs indicate that the turning point in business has been reached. With very few exceptions men believe this to be a fact. The machine tool people talk with greater confidence, and orders are being received in greater volume, though not in a large way. Inquiries are more numerous, though here, too, the change is a relative one. Announcements of industrial expansion are more often reported.

The additional factory which the Rivett Lathe & Grinder Company is erecting at Brighton, Mass., will be 50 x 100 ft., three stories, of brick and concrete, and will be used to care for the increase in business represented by the average of last year. The building was started about a month ago, but the cold weather came just as the concrete work was starting, and it is impossible to tell when operations will begin again. However, the company hopes to get into the addition by May 1. While the company has found a falling off of business in the last three months, it is still behind in its orders. In fact, it has been unable to lay up a stock of any kind of product in the past two years.

The new plant of the Locke Steel Belt Company, Bridgeport, Conn., manufacturer of sprocket chain, will be located on Bishop avenue, with a frontage of 460 ft. on the yards of the New York, New Haven & Hartford railroad at East Bridgeport. The main building will be 60 x 240 ft., one story, of reinforced concrete, and in addition there will be an office building and other structures. The site was deeded to the company by the railroad, which realized that as most of the market for the product is in the Middle West, and that much of the raw material comes from the same territory, contemplated plans for removal of the business from Bridgeport were a matter of large importance.

The building which the American Brass Company is erecting at Ansonia, Conn., 60 x 440 ft., two stories, will be used, on the first floor for shipping and receiving, and on the second floor for the storage of material.

The addition to the factory of the Washington Mills Emery Mfg. Company, North Grafton, Mass., manufacturer of Turkish emery, will double the plant. The structure is 50 x 100 ft., two stories.

The Connecticut Electric Mfg. Company, Bridgeport, Conn., is erecting a building 50 x 150 ft., four stories, of brick, slow-burning construction, which will be used for the manufacture of the Trumbull cyclecar. The company has been developing the model for some time, and proposes the manufacture on a large scale. Between 300 and 400 hands will be employed. The capital stock of the corporation has been increased from $25,000 to $200,000.

The General Electric Company has prepared plans for a $500,000 factory building at Pittsfield, Mass., for the small transformer department, but probably construction will not commence until 1915.

The building occupied by the Franklin Electric Mfg. Company, Hartford, Conn., will be given an additional story, 34 x 62 ft., to provide required space for the business.

The Rockwell Silver Company, Meriden, Conn., has increased its capital stock from $20,000 to $30,000.

The United States Armory at Springfield, Mass., has acquired additional land which will be used for a proposed addition, the estimated cost of which is $80,000.

The Union Hardware Company, Torrington, Conn., states that it does not propose immediately to utilize for building purposes the land recently purchased, adjacent to its property.

The Waterbury Clock Company, Waterbury, Conn., will utilize the new building now under construction at the case factory mainly for storage purposes, which will permit the transfer to manufacturing purposes the room vacated by the stock at the present case factory. The new building will be 50 x 182 ft., five stories.

The New England Iron Works Company, Boston, Mass., is rebuilding the plant at South Boston, recently destroyed by fire. The new works will be 130 x 175 ft., giving a somewhat greater capacity than the old shops. The building will have a steel frame, with cement walls, and fireproof throughout. No new equipment will be purchased, the company states. Standard boilers are manufactured.

Thomas J. Curtin, recently superintendent of the Corbin Screw Corporation division of the American Hardware Corporation, New Britain, Conn., has identified himself with the Colonial Screw Company, Montreal, Canada, as its superintendent. The new company is starting a factory, which will in the beginning turn out 2000 gross a day, and gradually increase to 20,000 gross. The output will at first be confined to wood screws, but later will include machine screws and bolts. The Cook Mfg. Company, Hartford, Conn., is furnishing the wood-screw machines. As for other requirements the company has not completed its plans, Mr. Curtin states.

The Acme Wire Company, Hamden, Conn., has begun the construction of a building 60 x 400 ft., two stories and basement, of reinforced concrete.

An iron foundry is in process of erection at Nashua, N. H., the owners being E. W. Lombard, F. A. Littlefield and Joseph Labine.

It is stated at New London, Conn., that Spiers Bros., manufacturers of boilers, are contemplating the establishment of a new plant at Fort Neck.

Philadelphia

PHILADELPHIA, PA., January 19, 1914.

New business comes out sparingly. Inquiries are usually for single tools, with an occasional small group of machine tools. Tool builders continue to operate plants on an irregular basis. In instances makers of special equipment, particularly of the smaller classes, are fairly busy. The machinery trade feels encouraged in view of better prospects in iron and steel conditions, but it is expected that consumers will defer purchases, if possible, until an upward trend of general business is definitely established. A moderate volume of business is moving in power plant equipment, both new and second hand. Second-hand machinery continues comparatively dull.

Harmon Dyer, engineer, is reported to be preparing plans for a one-story electric power plant, 28 x 38 ft., to be erected in Pottsville, Pa.

The Philadelphia & Reading Railway is having plans prepared for a two-story machine shop to be erected in connection with its roundhouse and engine yard at Ninth and Brown streets.

The James Cave Estate will erect a one-story manufacturing building, 40 x 152 ft., at Robinson street and Haverford avenue. The business for which the building will be used has not been disclosed.

The Acme Staple Company, Camden, N. J., has been incorporated with a capital stock of $100,000 to manufacture machines for making wire staples, etc. The incorporators are J. G. Mackey, A. Flowers and J. H. Bernheiser, Camden, N. J.

Bids are going in for a garage and hall to be erected at South and Water streets from plans by Magaziner & Potter, engineers, for John Cassidy. The building is to be brick and concrete, three stories, 30 x 40 ft., with steam heat. Metal sash and frames are specified.

Ballinger & Perrot, engineers, have plans under way for a two-story garage, 40 x 105 ft., to be erected at Washington, D. C. Engineers will be ready for bids in about two weeks.

The Huxley Bronze Casting Company, Wilmington, Del., has been incorporated with a capital stock of $50,000. It plans to equip and operate factories for smelting ores and metals. N. S. Huxley, J. W. Huxley, Jr., and M. P. Huxley, Wilmington, Del., are the incorporators.

It is reported that the Pullman Car Company has plans completed and proposes to erect a $30,000 addition to its plant at Wilmington, Del.

The C. D. Pruden Company, Warner, Dock and Bayard streets, Baltimore, Md., has leased a site at Warner and Haines streets and will erect a factory,

40 x 116 ft., for the manufacture of kalamined sashes and doors.

Recent improvements at the American Pulley Company's plant, Philadelphia, have increased its manufacturing capacity 24 per cent. The new warehouse, with capacity for 40,000 belt pulleys, insures facilities for storing stock sufficient to meet increasing demands. This building is strictly fireproof. It has brick walls, tile roof, concrete floors, metal racks, metal bins and shelving and metal window frames. The second floor of the building is being used as offices, the former office space being utilized as an addition to the machine shop.

Chicago

CHICAGO, ILL., January 19, 1914.

The improvement in inquiry since the first of the year has been so marked as to lend pronounced encouragement to the trade. The turn of the tide has extended to the smaller manufacturer with unusual rapidity and better business is reported from many quarters. With reference to the railroads, purchases of machinery totaling between $4000 and $5000 have been made by the New York Central Lines for the Lake Shore & Michigan Central. The recent inquiry issued by the Illinois Central has temporarily been held up but its placing in the near future is confidently expected.

The Chicago Junction Railway Company, Chicago, is building a one-story blacksmith shop, 25 x 36 ft., on West Thirty-ninth street, to cost $3,000.

The Commonwealth Edison Company, Chicago, is about to build three one-story and one three-story power houses, the aggregate cost of which is estimated at $600,000.

The Decker Bros. Piano Company, Chicago, whose plant was destroyed by fire recently, has leased a four-story manufacturing building in which it will resume operations. It is located at 1223 Miller street.

The plant and equipment of the Illinois Spring & Wire Company, 2337 North Fortieth court, Chicago, is to be sold at receiver's sale January 27 at the office of Frank M. McKey, receiver, 1047 First National Bank Building.

The Hancock-Bragg Railway Supply Company, 127 North Dearborn street, Chicago, with a capital stock of $2500, will manufacture and sell car and locomotive replacers. Address care of David D. Kagy.

The Royal Electric Heater Company, Chicago, incorporated with a capital stock of $10,000, will manufacture electric heaters and appliances, also motor accessories. The company may be addressed in care of William V. Brothers, 139 North Clark street.

W. H. Rosecrans Engineering Company, 30 North LaSalle street, Chicago, engineer for the village of Maywood, Ill., a suburb of Chicago, is receiving bids on a motor-driven air compressor, three motor-driven centrifugal pumps, switchboard and equipment.

The city of Batavia, Ill., has under consideration the addition of another unit to its present municipal power plant.

Hartman, Hay & Reis Company, Belleville, Ill., has acquired the machinery and business of the Germania Refrigeration & Machinery Company of San Antonio, Tex., and will bring the plant to Belleville. The making of nails by this company will be discontinued.

The Illinois Terminal Railroad, operating between Alton, Ill., and St. Louis, will spend approximately $60,000 in the enlargement of its repair shops at Alton.

The plant of the Central Metal & Machine Company, Davenport, Iowa, was damaged by fire, most of the injury being confined to the machinery and transmission. The company manufacturers steel barrels.

The Atlantic Southern Railroad operating out of Atlantic, Iowa, will build a small machine shop in that city, construction to begin at once.

The Simpson Windmill & Machine Company, Fairbury, Neb., has secured manufacturing quarters in Omaha and is moving its plant to that city. The company's new building will be 68 x 132 ft., and will be ready for occupancy March 1.

J. R. Morris, Waterloo, Iowa, has purchased the plant of the Danielson Implement Company, Independence, Iowa, and will take to Independence the drop forging business he has been conducting at Waterloo.

The Champion Mfg. Company, Cedar Rapids, Iowa, has been incorporated and has purchased the plant and equipment of the Eureka Stone & Ore Crusher Company, Cedar Rapids. The new company will manufacture cement mixers, steel farm gates and various other articles and will install a galvanizing plant and several new machines. Lucian T. Wilcox is president and F. H. Douthitt manager.

The Darb Mfg. Company, Waterloo, Iowa, maker of light delivery wagons, trucks and motors, advises that the proposed new factory mentioned last week will be 80 x 700 ft., and that an office building, about 30 x 80 ft., will also be erected. The company expects to begin operations in the new plant about April 1. Recently $100,000 of preferred stock was sold to finance the enlargement of the business. C. W. Hellen is president.

The Dewey Lumber Company, Polson, Mont., plans the construction of a 30,000-ft. capacity saw mill. Operations will begin before spring.

Milwaukee

MILWAUKEE, WIS., January 19, 1914.

The gradual enlargement of pay-rolls, due to increased production, is the best sign of the times. Although the improvement is slow, no disappointment is expressed. Inquiries are coming in much more freely than for several months and appear to be solidly based. Bookings are still light, consisting mostly of individual orders. A direct stimulant, such as renewed activity in railroad building and improvements, is needed. At the middle of January, the general shop operations in this district averaged 65 per cent. of normal, a comparatively good gain since the month opened.

The early opening of the Panama Canal is encouraging to Milwaukee machinery builders who have large foreign trade. The saving in time on deliveries was brought to mind this week, when the Chain Belt Company, Milwaukee, made a large shipment of standard concrete mixing machinery to Australia, via San Francisco. It will require eight weeks on this route, whereas the opening of the canal will make it possible for a similar shipment to be delivered in four weeks.

The expected resumption of operations in the automobile motor plant of the bankrupt Milwaukee Motor Company at Thirty-second and Burleigh streets, Milwaukee, is not to be realized. Harris Brothers, of Chicago, who purchased the plant from the receiver for $86,000, have decided to make immediate disposition of buildings and equipment, deeming it inadvisable to carry out the original intention of operating the plant to a profit-making condition before turning it over. Hence the entire equipment of lathes, drills, milling machines, screw machines, grinders, saws, shapers, belting, etc., is now being offered for sale piecemeal.

The board of school directors, Milwaukee, is having plans prepared and will take bids for a $50,000 addition to the Milwaukee School of Trades for Boys, at Virginia, Hanover and Greenbush streets and College place. The present school was built two years ago at a cost of $200,000. Frank M. Harbach is secretary and business manager.

The Milwaukee Common Council has adopted an ordinance appropriating $5000 for the purpose of a survey of the city to obtain recommendations for a new electric lighting system.

The Quam Pneumatic Cleaner Company, Milwaukee, has been organized by J. P. Quam, Victor Hamm and H. J. Trost, to manufacture, repair and sell vacuum-cleaning apparatus. The capital stock is $10,000.

The Wisconsin Welding & Cutting Company, Milwaukee, has been organized with $1000 capital by Samuel H. Smith, formerly secretary of the American Welding & Mfg. Company, Milwaukee. Lem L. Weil and William Wiesner are associated with Mr. Smith in the new project.

The Lincoln Box Company, Merrill, Wis., has been incorporated with $25,000 capital to establish a wooden

box and package manufacturing plant. J. G. Wenzel, George Misterek and Charles F. Hackbart are the promoters.

The Antigo Machine & Electric Company, Antigo, Wis., has been organized with a capital stock of $10,000 by Charles Ferguson, F. J. Zwickey, George A. Zwickey and Fred E. Sargent, to engage in a general manufacturing and repairing business in gasoline and electric motors, and operate an automobile garage.

The Kahlenberg Bros. Company, Two Rivers, Wis., which equipped a small gas-engine shop several months ago, has perfected its product, namely, a new type of internal combustion engine using the heavy distillates of petroleum as fuel, and is preparing to increase the facilities for a regular production. The engine is adapted especially for heavy-duty marine work.

The contract for all bridge work on the $100,000 Dover drainage project in Racine County, Wis., has been awarded to the Worden-Allen Company, Milwaukee, at $10,000. The general contract is in the hands of R. H. & G. A. McWilliams, Chicago, who will buy additional dredges and excavating machinery.

The four-story vehicle manufactory of the Monroe Mfg. Company, Monroe, Wis., was destroyed by fire January 14. The Karlen Automobile Company, occupying part of the first floor as a garage and machine shop, suffered a total loss also. The fire caused a loss aggregating $125,000. Plans for rebuilding are being considered.

Detroit

DETROIT, MICH., January 19, 1914.

A slightly increased activity is noted in the local machinery market. Sales are not very numerous, but inquiry is coming out in better volume and a more cheerful tone is prevalent. The coming automobile show is arousing considerable interest and hopes are entertained that the machinery business will be indirectly benefited in various ways through the meeting of manufacturers and dealers. Second-hand machinery is in light demand. A moderate movement in electrical equipment is noted. Contractors are less busy and only a small amount of new work is reported. Conditions in interior manufacturing centers, such as Lansing, Jackson, Pontiac, Flint and Saginaw, are reported promising and the majority of manufacturers express themselves as pleased over the outlook for improved business in the early spring.

The Detroit United Railway, Detroit, which operates the city's street car system, has petitioned the Michigan Railroad Commission for authority to issue $2,000,000 of collateral trust notes to provide for track, shop and power house extensions. It is stated that the issue will probably be authorized.

The W. J. Burton Company, Detroit, manufacturer of metal ceiling, has purchased a plot adjoining its present plant, on which an addition will be erected this year.

The National Pattern & Mfg. Company, Detroit, has been incorporated with $5000 capital stock to manufacture wood and metal patterns. The incorporators are Joseph N. Whitliff, Frank A. Miller and Arthur Lehman.

The A. J. Detlaff Company, Detroit, has been incorporated with $150,000 capital stock to take over the tool and machinery manufacturing business conducted by Anthony J. Detlaff.

The Heat Treating & Welding Company, Detroit, has been incorporated with $8000 capital stock to engage in a general metal business. William Tatro and Lyman Baldwin are the principal stockholders.

The Sparta Foundry Company, Sparta, Mich., has been incorporated with $5000 capital stock to build and operate a foundry plant. The building will be 50 x 100 ft., one story, of reinforced concrete construction. G. E. Rose, Charles A. Johnson and B. N. Keister are the officers.

As the result of a recent election the village of Munising, Mich., will build a municipal waterworks plant and intake pipe to cost $23,000. T. R. Hasley, Menominee, Mich., is the engineer in charge.

The Frost Gear & Machine Company, Jackson, Mich., has filed notice of an increase of capital stock from $150,000 to $300,000.

The Wolverine Fixture Company, Detroit, will establish a branch plant at Greenville, Mich. A factory has been acquired and new machinery will be installed at once. J. W. Maples is president.

The American Specialty Company, Sparta, Mich., recently organized, has completed its new plant and will now install machinery. The company will manufacture automatic vending machines.

The Blood Bros. Machine Company, Kalamazoo, Mich., has increased its capital stock from $75,000 to $250,000.

The Kellogg Food Company, Battle Creek, Mich., has acquired a new factory building and will enlarge the scope of its business.

The Ohio Dairy Company, Morenci, Mich., will enlarge its plant by the addition of a bottling works.

Indianapolis

INDIANAPOLIS, IND., January 19, 1914.

The State Construction Company, Indianapolis, has been incorporated, with a capital stock of $50,000, to engage in general construction work. The directors are J. T. Elliott, G. R. Elliott and O. B. Ent.

The King Supply Company, Indianapolis, has been incorporated with $50,000 capital stock to manufacture machinery and mechanical devices. The incorporators are George W. Benedict, Edward L. Jones and William E. Evans.

The Domestic Refrigerating Machine Company, Indianapolis, has been incorporated with $10,000 capital stock, to manufacture refrigerating machinery. The directors are Frank M. Fauvre, Lee H. Geisendorff and Francis M. Fauvre.

The McGregor-Phillips Mfg. Company, Mt. Vernon, Ind., has been incorporated with $60,000 capital stock, to manufacture furniture. The directors are W. A. McGregor, E. McGregor and Eli Phillips.

The Raymond Porch Shade Company, Richmond, Ind., has been incorporated with $100,000 capital stock, to manufacture porch shades. The directors are Edward B. and Raymond B. Fletcher and Joseph E. Farnsworth.

The Citizens' Construction Company, Bloomington, Ind., has been incorporated to engage in a general construction business. The directors are C. H. Springer, M. H. Bogeman and J. E. Showers.

Notice of final dissolution of the Meteor Motor Car Company, Shelbyville, Ind., has been filed.

Cincinnati

CINCINNATI, OHIO, January 19, 1914.

The inquiry for machine tools of all kinds shows considerable improvement. Orders now coming in are mainly from domestic customers and for single tools. It is generally believed that the railroads will be large purchasers of all kinds of shop equipment as soon as the advance in rates is settled. The majority of shippers in this territory are in favor of the requested advance. The second-hand machinery business continues to show some improvement. There is no change in the situation with the jobbing foundries, and none is operating to full capacity. The supply of both skilled and common labor is plentiful.

The H. C. Wood Company, Norwood, Ohio, a Cincinnati suburb, will build a large ice and refrigerating plant at East End.

The announcement made last week that the Ford Motor Car Company, Detroit, Mich., had abandoned its plans for an assembling plant in Cincinnati was incorrect. It is now stated that the company has secured a suitable site on the Cincinnati, Lebanon & Northern Railroad and will commence work early in the spring.

The Von Wyck Machine Tool Company, Cincinnati, has increased its capital stock from $20,000 to $40,000. No immediate extensions are planned. Clifford B. Kern is general manager of the company.

It is reported that the Methodist Book Concern, Cincinnati, will soon be ready for bids for the large proposed addition to its plant.

B. L. Baldwin & Co., architects, Cincinnati, announce that they will be ready to receive estimates on the proposed large foundry building for the Lunkenheimer Company within six weeks.

The Mutual Garage Company, Norwood, Ohio, will build a large garage and repair shop on Montgomery pike. Plans are being prepared by Roland E. Hunt, Architect, Norwood.

The Modern Pattern Works, Cincinnati, will move its plant from the present location on Logan street to 1628-1630 Plum street, where more commodious quarters have been secured.

The Apple Electrical Company, Dayton, Ohio, contemplates the enlargement of its plant at an early date. The company was recently consolidated with the Splitdorf Company, Newark, N. J.

The Durable Dayton Truck Company, Dayton, Ohio, has been incorporated with $25,000 capital stock by V. A. Troxell, J. B. Ford, and others.

C. E. Martin & Bros., Mansfield, Ohio, manufacturers of silo accessories, culverts and steel garages, have acquired additional property adjoining their plant, on which they propose to erect a large factory building. Details as to machinery requirements are not yet available.

It is reported that the Lawter Tractor Company, Newcastle, Ind., will soon remove its factory to St. Marys, Ohio, and will add considerable machinery equipment.

The Dayton Engineering Laboratories, Dayton, Ohio, has plans under way for a large addition to its plant. The proposed building will be about 260 x 280 ft., seven stories and of reinforced concrete construction.

The Dayton, Springfield & Xenia Southern Railway Company, Dayton, Ohio, is contemplating erecting a power building and car barns, for which considerable equipment will be required.

The board of education, Springfield, Ohio, has extended the time for receiving bids on the machine shop and foundry equipment wanted for one of its schools until February 6. Mention of these requirements was made some time ago. John M. Derrickson is president of the board.

The Robinson Foundry Company, Richmond, Ind., contemplates enlarging its plant early in the spring. Building details are not yet available.

The Sutter Roofing & Cornice Company, Clarksburg, W. Va., announces that it will rebuild its plant recently destroyed by fire.

Cleveland

CLEVELAND, OHIO, January 19, 1914.

While the improved feeling in the machinery trade continues, little change has developed in the market. Dealers are doing a moderate volume of single tool business, but there is little inquiry for lots of any size. The demand for second-hand machine tools continues fairly good. Makers of automatic screw machinery report some improvement in orders. The demand for cranes continues quiet. In power plant lines considerable improvement is reported in the demand for equipment for fixing over old plants and a fair demand for engines in small units. However, not much inquiry is coming in for new plant equipment. In electrical equipment a fairly good demand appears for small motors and generators. In general manufacturing lines conditions appear to show some improvement. The demand in the foundry trade continues dull.

The Lake Shore & Michigan Southern Railroad will receive bids January 28, through A. R. Ingersoll, purchasing agent, Cleveland, Ohio, for a small lot of machinery equipment for its new car shops at Air Line Junction near Toledo, Ohio. The list is as follows:

One medium sized ripsaw.
One 16-in. automatic railroad cut-off saw.
One automatic circular saw sharpener.
Two 32-in. high duty drill presses.
Two 36-in. high duty drill presses.
One journal turning lathe.
One belt-driven drill grinding machine.
One 3-in. pipe cutting and threading machine.
Two belt-driven grindstones.

The Hydro-Pneumatic Cleaner Company, Cleveland, has been incorporated with a capital stock of $10,000 by H. A. Jeffrey, A. H. Lytle and others to manufacture vacuum cleaner machines.

The Kase-Rite Company, Cleveland, has been incorporated with a capital stock of $5000 by G. L. Gray and others to manufacture case hardening compounds.

The Industrial Electrical Company, Cleveland, has been incorporated with a capital stock of $25,000 by men connected with the Samuel Austin & Son Company, construction engineer. The company was formed to handle the electrical equipment installed in factories and other buildings erected by the Austin Company.

The Iceless Refrigeration Company, Cleveland, has increased its capital stock from $349,000 to $500,000.

The Yuster Axle Company is the name of a new Cleveland concern which will manufacture automobile axles. This company has been organized by M. L. Yuster, formerly general manager of the Hess Spring & Axle Company, Cincinnati, and has been incorporated with a capital stock of $200,000. The company has acquired a large part of the plant formerly occupied by the Royal Motor Car Company at East Seventy-second street and the Lake Shore Railroad and is now installing new equipment.

The Hercules Spring Bed Company, Cleveland, has been incorporated with a capital stock of $25,000 to manufacture spring beds. Among the incorporators are R. C. Moody, W. A. Comstock, C. H. Erickson and others.

It is announced that the Erie Railroad has completed plans for the erection of a large ice-making plant and an icing station at Marion, Ohio.

The City Machine & Tool Company, Toledo, Ohio, recently incorporated with a capital stock of $50,000, will establish a plant in the Toledo Factories Building about February 1 and will manufacture gasoline and oil pumps, for use in garages, and tools and dies. Louis P. Kinsey is the president.

Some electrical equipment will be required for the municipal lighting plant in Huron, Ohio, plans for the remodelling of which will be prepared shortly.

The Akron Steel Casting Company, Akron, Ohio, has increased its capital stock from $10,000 to $25,000.

Wheeling

WHEELING, W. VA., January 19, 1914.

The machinery of the Fletcher Enamel Company is being moved from the old plant in Indiana to the new plant in Dunbar, W. Va.

The East Side Utilities Company, Fairmont, W. Va., has decided to operate sand deposits on the Valley River, beginning next spring, and will need machinery. C. D. Robinson is president of the company.

The Woods Mobilette Company, Chicago, Ill., manufacturer of cyclecars, is negotiating for a site for its plant at Wheeling, W. Va., through F. A. Woods, president of the company.

Dorcas & Ryan, Hendricks, W. Va., are organizing a company to manufacture a combination gas and coal stove. They are as yet undecided whether to build a factory or have the parts made by others. Address L. B. Dorcas, Box 3.

The pottery plant of the Consolidated Manufacturers' Company, Grafton, W. Va., will be ready for installation of machinery April 1. A. O. C. Ahrendts, East Liverpool, Ohio, is president of the company.

The Midland Mfg. Company, Saginaw, Mich., manufacturer of the Crawford motorcycle, will move its plant to Morgantown, W. Va., where a factory is being erected. Electric power will be used. B. S. Crawford is president of the company.

The Howe Company, Wheeling, W. Va., has been incorporated with $25,000 capital stock to manufacture farm implements, water motors, hardware specialties, etc. The incorporators are James Henderson, James McCann, H. E. Dunlay, and others.

The National Interior Finish Company, Huntington, W. Va., has been incorporated with $80,000 capital stock to manufacture interior finish, panel work and stairs in hardwood only. The incorporators are E. M. Byrne, F. W. Castle, of Paintsville, Ky.; H. C. Warth, and others, of Huntington.

The Guyan Machine Shops, Logan, W. Va., have been incorporated with $25,000 capital stock by W. H. Oliver, Jr., Bernard Shell, J. J. Ross, and others.

The Amos-McBride Carriage Works, St. Clairsville, Ohio, were totally destroyed by fire with a loss of $15,000.

To manufacture traveling cranes, chain box and other machinery, the O. A. & H. G. Thayer Company, Charleston, W. Va., has been incorporated with a capital stock of $5000 by G. H. Shrewsbery, O. A. Thayer, H. G. Thayer and others.

The Central South

LOUISVILLE, KY., January 19, 1914.

Business continues to show improvement, not so much in the actual volume of trade handled as in the better sentiment evident on the part of equipment manufacturers and dealers. The demand for boilers probably is not as brisk as last week, but other lines are continuing to show betterment. Manufacturers of motors and other electrical equipment are getting a good deal of business growing out of the substitution of alternating-current motors for equipment of the direct-current type, this change having been encouraged by central stations. Inquiries are coming in in normal number and the prospects for new business are entirely satisfactory.

Henry Pilcher's Sons, Louisville, organ manufacturers, are to purchase 24 alternating-current motors for installation in their factory. The present equipment is direct-current exclusively.

The Louisville office of the American Creosoting Company reports that the plant which it is to establish at Woodward, Ala., is not to be merely for creosoting, but it will be a distilling plant by which by-products from coke ovens will be manufactured into creosote and other coal tar products. It will not be erected at once but will be equipped later in 1914.

J. Earl Henry, architect for the Louisville Board of Education, has completed preliminary plans for the new boys' high school building, which will be erected at a cost of $250,000.

The J. D. Distillery, located near Marrowbone, Cumberland County, Ky., was burned recently. Rebuilding plans are now being considered.

The plans of the Kentucky Utilities Company, Lexington, Ky., for supplying the coal mines of eastern Kentucky with current for power purposes are being expanded. The company has plants at Varilla, Middlesboro and Pineville, Ky., and at Pennington Gap, Va. All of these are to be enlarged, transmission lines are to be built connecting them, and the mines in the entire district are to be served.

The St. Louis & Tennessee River Packet Company has announced through its office at Paducah, Ky., that a steamboat will be built this spring for use in the Tennessee River trade. Boilers and other equipment will be needed. S. K. Hale is president of the company.

R. L. Heck, Corydon, Ky., is planning the manufacture of a patented attachment for lawn rakes.

The Louisville Pillow Company, Louisville, Ky., suffered the loss of its shoddy factory by fire and is planning reconstruction. Motor-driven pickers and other equipment will be installed.

Goodin, Brown & Co., Elizabethtown, Ky., will install equipment for the operation of a rock quarry.

The Louisville & Nashville Railroad Company, Louisville, is building a large roundhouse at Irvine, Ky. Shops will also be constructed.

LaCenter, Ky., is considering installing an electric light, water and ice plant. Address the mayor.

Harry M. Logan, owner of a lighting plant at Bloomfield, Ky., is planning the enlargement of the system.

The city of Carrollton, Ky., will probably purchase a boiler, alternating-current generator, switchboard and other machinery for delivery within the next 90 days.

The city of Bowling Green, Ky., plans to enlarge its electric light plant to supply current for the operation of an ornamental lighting system which is to be established there.

The Philadelphia Oil & Gas Company, Winchester, Ky., is in the market for steel derrick, hoisting and other equipment.

The city of Newport, Ky., has ordered plans prepared for improvements to the waterworks pumping plant which will require an expenditure of about $50,000.

An ice plant with a daily capacity of 10 tons is to be installed at London, Ky., by S. W. Easley, of Williamsburg, Ky.

The Anglo-American Mill Company, Owensboro, Ky., will add considerable new equipment to its flour mill at once.

An electric light plant and waterworks will be built at Campbellsville, Ky., by the Campbellsville Public Utilities Company.

The Eureka Coal & Mineral Company, Lexington, Ky., has been incorporated with a capital stock of $75,000 by O. A. Sears, W. H. Ronan, and others.

The Greenwood Flooring, Mill & Elevator Company, Rogana, Tenn., R.F.D from Bethpage, will replace with about $15,000 worth of equipment its plant recently burned.

The National Sanitary Drinking Cup Cabinet Company, Memphis, Tenn., has been incorporated with a capital stock of $15,000 to manufacture drinking cup cabinets.

The Maryland Coal & Coke Company, Maryland, Tenn., recently incorporated with $50,000 capital stock, will proceed at once to develop mining property. J. S. Cline, Crab Orchard, Tenn., is president.

The Memphis Coal Briquette Company, Memphis, Tenn., is reported to have been organized and to have plans for equipping a plant of 200 tons daily capacity.

The Dickson Planing Mill Company, Dickson, Tenn., references to the proposed improvements of which were made recently, states that the additional machinery needed is for its hardwood flooring department.

The Pittsburg Power Company, Pittsburg, Tenn., is planning the construction of an electric light plant at a probable cost of $15,000.

The Knoxville Sawmill Company, Knoxville, Tenn., the plant of which was recently burned, will construct a new mill at a cost of about $25,000.

E. C. Knight, Livingston, Tenn., will construct a water plant. A gasoline engine for the operation of a pump will be installed.

The Southern Public Utilities Company, Anderson, S. C., will install three new generators of 1500 kw. capacity each to replace burned equipment. Two of the generators have been purchased.

Birmingham

BIRMINGHAM, ALA., January 19, 1914.

Machinery dealers report a greater number of inquiries than they have had since the depression in their business began in the fall of 1913. The depth of the depression was reached in December. The present inquiry is for boilers, steam engines and motors, with an occasional one for gasoline engines. The sawmill trade is still slack and mines are ordering little. Actual transactions are for filling-in material and equipment, but the tone of inquiry, according to dealers of good judgment, presages a decided improvement over the low ebb of November and December.

John Birdsell and others propose to establish a soil-pipe plant in Gadsden, Ala. The cost is estimated at $75,000.

The Pitts Shoe Company, Montgomery, Ala., has been incorporated with a capital stock of $100,000 by W. E. Pitts, John S. Pitts, L. B. Whitfield, C. J. Bean, and others. The company plans to erect a shoe factory.

Ford, Bacon & Davis, engineers, New York, have been engaged by the Birmingham Railway, Light & Power Company to take charge of the extension and improvement of the electric lighting system.

The water and light department, Ozark, Ala., is planning the purchase of 100-hp. boilers, 200-kw. generator and switchboard, 300-hp. Corliss engine, etc.

The Birmingham Ice Company, it is reported, will establish cold storage plants in several of Birmingham's suburbs.

The Lerio Turpentine Cup Company, Mobile, Ala.,

has been incorporated with a capital stock of $150,000 and proposes to build a plant for the manufacture of metal cups. S. A. Tonsmeire, Louis Lerio, L. A. Woodward, W. O. Daly, and others, are interested.

The Marble Quarry Company, Sylacauga, Ala., will install additional machinery.

In addition to new Koppers coke ovens, the Woodward Iron Company, Woodward, Ala., will install another coal washer.

George B. Garrison, Bloomington, Ind., proposes to establish a brick plant at Tuscaloosa, Ala.

The Fouras Ore Company has been incorporated and will engage in ore mining. D. W. Troy, Montgomery, Ala., is the legal agent.

The Newnan Elevator & Feed Company, Newnan, Ga., has been incorporated with a capital stock of $10,000. It is proposed to operate an elevator and grind feed. A. W. Powers, B. T. Thompson, and others, are interested.

The Hebard Cypress Company, Waycross, Ga., will establish an electric lighting and power plant to cost $80,000.

Augusta, Ga., is planning to construct an electric light plant at a cost of $250,000. Final details will be decided on next month.

Glennville, Ga., will issue $13,000 of bonds to build an electric light plant.

C. A. Powers, Miami, Fla., is reported to be in the market for equipment for a garage.

The Melton Lumber Company, Palatka, Fla., will probably erect a large sawmill at Roy, Fla.

F. M. Sanderson, and others, Plant City, Fla., are planning the establishment of a planing mill and will need power and woodworking equipment.

The German-American Lumber Company, St. Andrew, Fla., will build a planing mill.

St. Louis

ST. LOUIS, MO., January 19, 1914.

Inquiries which continue to increase in number and in diversity have given to machine tool dealers a more cheerful feeling. The demand for tools continues to be for single machines, but there are enough transactions together with inquiries, both actual and tentative, to lead to the impression that within a short time greater activity will be in evidence for several months. There is some request for second-hand equipment, but nothing especially striking in its character. Collections are reported satisfactory and capital is stated by banking interests and others to be much easier.

The Wagner Electric Mfg. Company, St. Louis, has increased its capital stock from $1,500,000 to $1,800,000 in furtherance of its extension of operations and enlargement of plant and equipment.

The Materne Mfg. Company, St. Louis, will make an addition to its machine shop to accommodate some new equipment which is to be added.

The Mogul Motor Truck Company, St. Louis, has been incorporated with a capital stock of $100,000 by George C. Griffith, P. R. Walsh and C. S. Cobb.

The Panama Rubber Company, St. Louis, has been incorporated with capital stock of $13,000 by Carl G. Schwarz, F. W. Sanner, and others, to equip a plant for the manufacture of raincoats, etc.

The Mohr Umbrella Company, St. Louis, has been incorporated with a capital stock of $50,000 by Bernard Mohr, Sr., and Jr., to manufacture umbrellas and similar products.

A heating, lighting and ventilating plant to cost about $40,000 will be required for the University of Missouri Library Building at Columbia, Mo. A contract has recently been let for the building construction.

The Rockhill Laundry Company, Kansas City, Mo., has been incorporated with capital stock of $8000 by G. G. Mapes, D. A. Squires and E. H. Lowry, and will equip a steam laundry plant.

The National Marble Company, Kansas City, Mo., has been incorporated with a capital stock of $20,000 by A. D. Madeira, Jos. L. Tupy and John J. Floyd, and will equip a stone sawing and cutting plant.

The King City Electric & Mfg. Company, King City, Mo., has been incorporated with a capital stock of $8000 by George Ward, George P. Adams and Harry V. Forrest, and will equip a plant.

The Forrester-Nace Box Company, Kansas City, Mo., has increased its capital stock from $30,000 to $100,000 for the purpose of increasing its plant capacity.

Morris & Co., packers, are reported as planning improvements in their plant at St. Joseph, Mo., involving an expenditure of about $35,000 for an ice plant and other equipment.

A brick plant with a capacity of about 30,000 bricks per day will be equipped at once at New Florence, Mo., by the Chicago Fire Brick Company, Chamber of Commerce Building, Chicago, Ill.

The Oak Orchard Mining Company, Joplin, Mo., will install a concentrating plant on its mining property.

The Waneta Mining Company, Joplin, Mo., will rebuild its concentrating plant, recently burned. The capacity will be 300 tons daily.

The Arkansas Lumber & Supply Company, Arkadelphia, Ark., has been incorporated with a capital stock of $10,000 by N. V., H. L. and V. L. Wright.

The J. W. Black Lumber Company, Little Rock, Ark., has been incorporated with a capital stock of $50,000 by J. W. and C. R. Black and M. G. Hoffman.

The Bradley Lumber Company, Warren, Ark., has been incorporated with a capital stock of $50,000 by J. L. Jamison, D. A. Bradham and V. R. McKinney.

The Harmon-Thomas Construction Company, St. Louis, Mo., has been awarded a contract for $400,000 of levee construction in the vicinity of Helena, Ark., and is reported in the market for additional equipment.

Plans are being completed for the city of Harrison, Ark., for sewer, waterworks and allied plant equipment, for which bids are to be asked in about a month. Albert C. Moore, Joplin, Mo., is engineer in charge. The total cost will be about $90,000.

The Mount Olive Stave Company, Mt. Olive, Ark., will equip a mill at Cotter, Ark., to work up timber on a tract just purchased.

The Palmetto Novelty Works Company, Palmetto, Ark., will equip a mill now under construction with woodworking machinery, about 12 tools being required.

The Little Rock & Pine Bluff Interurban Company, is reported to be financed and ready to begin contracting for equipment. C. X. Kavanaugh, of Little Rock, Ark., is interested.

The Osena Oil Company, Inola, Okla., is in the market for power equipment and drilling apparatus. C. W. Dieterle is in charge.

A waterworks system to cost $14,125 is to be constructed at once at Devol, Okla., including deep-well pumps, oil engine, etc.

The Open Air Bed Company, Enid, Okla., has been incorporated with a capital stock of $10,000 by T. B. Thirman, E. E. Brown and Harry O. Classer, and plans to equip a factory.

The Pryor Bottling Works, Pryor, Okla., recently incorporated with a capital stock of $14,000, will equip a bottling plant shortly. W. T. Whittaker is president.

The Janes-Kilpatrick Post & Tie Company, Oklahoma City, Okla., has been incorporated with a capital stock of $15,000 and will establish a mill and install other equipment.

The Rebold Lumber Company, Okmulgee, Okla., has been incorporated with a capital stock of $40,000 by John H. Rebold, W. C. Newman and Albert Shelton.

The Okeene Milling Company, Okeene, Okla., has plans for the installation of considerable additional equipment.

The Jordan River Lumber Company, Kiln, Miss., will rebuild its burned mill and install equipment of 250,000 ft. daily capacity.

The Brookhaven Lumber & Mfg. Company, Hattiesburg, Miss., will build a sawmill at the site of its present planing mill near Hattiesburg, where it owns 8000 acres of timber land.

The Marathon Lumber Company will begin the construction and equipment of a plant at Laurel, Miss., in about 30 days. H. Bissell, Wausau, Wis., is president.

J. S. Randolph & Sons, Gulfport, Miss., are reported to have plans for the installation of wagon manufacturing machinery.

The International Distilling Company's plant and the United States Industrial Alcohol Company's plant at New Orleans, La., have been destroyed by fire with a loss of about $750,000. It is stated that both will be re-equipped.

H. M. Wheeler and J. C. Jones have plans for the immediate equipment of a buggy manufacturing plant at Jonesville, La.

The American Creosote Works, Ltd., New Orleans, La., has been incorporated with a capital stock of $100,000 by J. M. Van Der Veer, S. W. Labrot and E. L. Powell.

The New Orleans Roofing & Metal Works, New Orleans, La., will enlarge its plant, add new machinery and generally increase its equipment for making tanks and culverts. It will also add equipment for the manufacture of acetylene gas generators.

The Louisiana Oil Exporting Company, New Orleans, La., will erect 10 tanks and also install pumping equipment in connection with its operations. Charles T. Madison, Shreveport, La., is manager.

An ice and an electric light plant are to be equipped at Singer, La., by J. W. Brown.

Dunham & Robinson, Alexandria, La., will construct a sawmill with a capacity of 50,000 ft. of lumber a day.

The Naylor Mfg. Company, Jennings, La., has leased buildings and machinery for the manufacture of a harrow attachment and will start operations at once. The company has a capital stock of $15,000.

Texas

AUSTIN, TEX., January 17, 1914.

A slightly improved condition in the machinery and tool trade is reported, with prospects for its continuation. A number of artificial ice factory projects has created an encouraging demand for ice-making machinery.

The Pleasanton Ice & Electric Light Company, Pleasanton, is expending $5000 in installing new machinery and enlarging and improving its plant.

C. Hansen, representing Northern glass factory interests, has completed arrangements for the erection of a glass factory at Henrietta.

It is announced that about $80,000 will be expended on machinery to equip the new power plant which the Texas Power & Light Company is building in East Waco.

The Texas Power & Light Company has taken over the light and ice plants of the Ennis Ice, Light & Power Company and will expend $50,000 in enlarging and improving the plants. The capacity of the ice plant will be increased to 95 tons daily, it is announced by Mr. Rutherburg, manager. An addition will be built to the present building, and new distilling, purifying and condensing machinery installed.

The bond issue of $20,000 recently voted by the town of Quanah to improve the waterworks plant and system have been approved by the attorney-general's department. Work will be started soon, it is stated.

The Goliad Supply Company is erecting a new ice plant at Goliad to replace the one recently destroyed by fire. E. F. Glass is manager of the company.

The E. Z. Opener Bag Factory Company is doubling the capacity of its factory at Orange and installing much new machinery. It is the only paper bag factory in Texas. Yellow pine refuse is used.

The Artesian Ice Company, Rockwall, has been organized with a capital stock of $15,000 to erect an ice plant. The incorporators are J. M. Thomas, I. J. Austin and W. D. Austin.

The Rusk Light & Power Company has increased its capital stock from $10,000 to $20,000 and will enlarge and improve its light plant at Rusk.

The Rose Mfg. Company, Dallas, has increased its capital stock from $50,000 to $200,000 and will make extensive improvements.

The Eldridge Sugar & Feed Company, San Antonio, is being organized to erect a plant to manufacture the Eldridge stock food, now being made at Sugarland. The plant will have a capacity of about 100,000 tons yearly. D. J. Woodward, of San Antonio, is at the head of the project.

E. A. Clousnitzer, of Quanah, who recently purchased the Yorktown Light & Ice Company at Yorktown, will install a German Diesel engine immediately and will begin a complete remodeling of the light and ice plant.

The Pacific Northwest

SEATTLE, WASH., January 14, 1914.

Puget Sound industrial conditions have been slightly ruffled owing to two strikes now under way—one at the plant of the Tacoma Smelting Company, Tacoma, and the other at the plant of the Pacific Steel Company at Youngstown, near Seattle. The walk-out has been directly caused by the forming of unions affiliated with the Seattle Central Labor Council and the Amalgamated Association of Iron, Steel and Tin Workers. The corporations refuse to recognize the unions. The plant of the St. Paul & Tacoma Lumber Company, which has been shut down for two weeks undergoing extensive repairs, has resumed operations with 500 men. An indication of the encouraging outlook in the lumber market for the year is the fact that the St. Paul & Tacoma Lumber Company will operate a night shift, increasing its total force by 200 men. Several other large mills in southeastern and western Washington have resumed operations since the holiday shut-down. Local machinery houses report fair business for the week past with an encouraging outlook. Considerable business was transacted in milling and mining machinery. Collections are fair.

The United Mine Workers of America, on January 10, called off the strike in the Stone & Webster coal mines in Renton, which has been on for 18 months.

Kirkland, Wash., recently voted a bond issue of $18,000 for the installation of a municipal water system. Address the city clerk.

The Capitol City Iron Works, Olympia, Wash., was recently incorporated by J. Bamford and F. A. Nicholson with a capital stock of $25,000. It is understood a plant will be built the coming spring.

The British-American Talcum & Graphite Company, Seattle, has been incorporated with a capital stock of $50,000. Properties lying within the State of Washington will be developed. The incorporators are Edward W. Green, Clarence F. Ritchey, Solomon D. Bales and John D. Fulrock.

Nelson Troyer, John Fox and F. C. Fox, Seattle, recently incorporated the Seattle Astoria Iron Works Company, Seattle, with a capital stock of $200,000.

The Leavenworth Lumber Company, Leavenworth, Wash., contemplates improvements and extensions to its plant which will double its capacity. The work will be done before spring.

The saw mill of the Pacific States Lumber Company, Selleck, Wash., was recently destroyed by fire with a loss of $200,000. E. B. Shields, vice-president of the company, states that the mill will be rebuilt at once.

F. S. Cannon and others, Wenatchee, Wash., will build a woodworking plant in that city. Plans for the proposed improvement are practically completed.

The Lewiston Electric Light & Power Company, recently petitioned the Municipal Board of Lapwai, Idaho, for a franchise to construct and operate an electric lighting system in that city.

Jacob Weinhard, Dayton, Wash., is considering the installation of an electric light and heating plant in Dayton.

The Trustee Company, Spokane, Wash., recently petitioned the city commission for the right to construct a power plant and sell electric current for light and power in that city.

The Colorado Alfalfa Milling Company, Boulder, Col., is considering the installation of a mill at Twin Falls, Idaho. The Commercial Club of Twin Falls is interested. H. Casaday, Boulder, is vice-president.

The Western Co-operative Building Company, St. Maries, Idaho, has the contract for the construction of buildings and the installation of machinery for a creamery to be built in St. Maries. This company will receive bids for machinery shortly.

San Francisco

SAN FRANCISCO, CAL., January 13, 1914.

Notwithstanding the very favorable indications for the year as a whole, business and industrial conditions will evidently require some time to recover from the present depression. So far no sign of activity in the machinery market appears and work is unusually slack at most of the shops in this immediate vicinity. Plenty of work is in sight for spring and summer, but much of it is contingent upon various uncertain factors, and users of machine tools are disposed to wait for a definite revival before increasing their equipment. Stormy weather throughout the State has also had a retarding influence for the last fortnight, practically putting a stop to outside construction work, though very little damage has been done. Orders are appearing with a little more frequency than last month, but in practically all lines are of an unimportant nature. Contracts, however, are pending which, if carried out, will give rise to a good general demand for all classes of machinery.

Fred Ward & Son, who recently took up the lines of machine tools formerly handled by Henshaw, Bulkley & Co., have placed orders for a good-sized stock, and are preparing to enter the business in a large way.

The Rix Compressed Air & Drill Company has moved into new quarters at 5 First street.

It is reported that the Union Iron Works will shortly build a large fire-fighting tug for the Standard Oil Company, and a bay steamer costing about $350,000 for the Monticello Steamship Company.

The city of San Francisco has let contracts for 100 electric cars. As the bids were below the estimate, a number of additional cars will probably be ordered. An award on tools for the municipal carshop is expected in a few days.

Johnson & Rogers, who are starting a new shop for general machine work at Sacramento, Cal., have placed orders for a number of tools.

The owners of the Sperry flour mill, Vallejo, Cal., are putting up a grain elevator, which will be equipped with hoisting and conveying machinery.

The town of San Bernardino is taking figures on a horizontal cross-compound crank and flywheel Corliss type pumping engine, of 3,888,000 gal. daily capacity against a head of 235 ft.

G. H. Minier and G. A. Osgood, formerly with the Lowe Gas Range & Heater Company, are preparing to start a stove factory at South Pasadena, Cal.

Eastern Canada

TORONTO, ONT., January 19, 1914.

Silverwoods, Ltd., London, Ont., is contemplating the erection of a creamery to cost $15,000.

The Canadian Locomotive Company, Ltd., Kingston, Ont., will erect a machine shop to cost $68,000.

A refrigerating machine may be required for the warehouse of the Harris Abattoir Company, Ltd., Sudbury, Ont.

M. Morrison, Guelph, Ont., will erect a creamery at Belleville, Ont.

S. F. Lawrason & Co., London, Ont., will make alterations and install new machinery in their soap factory to cost about $25,000.

Logan & Sons, Caledonia, Ont., are having plans prepared for the construction of a machine shop and foundry to cost $7000.

The Wood Mosaic Company, New Albany, Ind., has suspended arrangements for the erection of its plant at Stratford, Ont., until spring. The plant will cost $100,000.

Work will be started in the spring on the erection of the factory for Dowsley Spring Axle Company, at Windsor, Ont. The plant will cost $7000.

The Abitibi Pulp & Paper Company, Iroquois, Ont., is erecting a pulp and paper mill to cost $1,500,000.

The E. B. Eddy Company, Hull, Ont., will soon have its enlarged plant in operation. The machinery is being installed now. The company is expending over $1,000,000 in improvement plans. The present match factory will be converted into a paper factory and matches will be manufactured in a new and larger building. The pail and tub plants will also be rebuilt on a larger scale.

The Canada Nail & Wire Company, Ltd., St. John, N. B., will award the contract for the erection of its new factory, to be located at Coldbrooke, as soon as it has received its charter.

The Partington Pulp & Paper Company, St. John, N. B., has considerably enlarged its plant and is now erecting a warehouse and conveyor to carry the pulp from the mill to the warehouse.

The Interior Hardwood Company, Wilmot avenue, Berlin, Ont., will build a large addition to its factory.

The Valliere Furniture Factory, Quebec, Que., was destroyed by fire with a loss estimated at $100,000.

The Polson Iron Works & Shipbuilding Company, Toronto, has undertaken contracts for the construction of crafts of various types for the Dominion Government and the Quebec Harbor Commission. The vessels contracted for will cost about $404,000.

Fire destroyed the W. K. Rankin excelsior packing plant, the Parker Brothers wood turning mill, the J. W. Woolnough showcase factory, the Toronto Woodworking Company's factory, and the R. Lembke cabinet works at the corner of Dundas street and Sheridan avenue, Toronto. The loss is estimated at $75,000.

The Reid Wrecking Company, Sarnia, Ont., will expend about $70,000 on its drydocks at Port Huron. A steel structure equipped with the latest machinery and apparatus for ship repairing will be erected at a cost of $45,000, and about $25,000 will be spent to erect a pump house.

C. T. Barnes, manager of the London Electric Company, London, Ont., announced that the company expects to complete the renovation and additions to its powerhouse within two months at a cost of $125,000.

The Eastman Kodak Company, Rochester, N. Y., has purchased 25 acres on the outskirts of Toronto on which a large factory will be erected.

Fire destroyed the storehouse and machine shop of the Canada Stone Company, Hamilton, Ont. The loss is estimated at $20,000, covered by insurance.

The Berlin Plate Glass & Mirror Company, Berlin, Ont., has purchased a lot on Victoria and Edward streets, on which a new factory will be erected. The structure will be two stories with cement foundation and will provide 13,000 sq. ft. of floor space.

The Robinson Oliver Grain Company's mills, Park avenue and Van Horne street, Montreal, were destroyed by fire. The loss is estimated at $200,000.

The Toronto Structural Steel Company is erecting a large factory north of Weston, Ont.

The Northern Electric Company, Ltd., Montreal, has been incorporated with a capital stock of $10,000,000 by Harry F. Sare, George R. Gray, and others, of Montreal, to manufacture electrical apparatus.

The Dominion Milk Flour Company, Ltd., Listowel, Ont., has been incorporated with a capital stock of $100,000 by William Climie, John Hodge, and others, to manufacture dairy products.

The Gardner Basket Company, Ltd., St. Catharines, Ont., has been incorporated with a capital stock of $45,000 by Robert Thompson, Arthur Onslow, and others, to manufacture boxes, baskets, etc.

J. H. Allard, Ltd., L'Epiphanie, Que., has been incorporated with a capital stock of $50,000 by Joseph H. Allard, Georges Dufort, and others, to manufacture lumber, etc.

The A. B. See Electric Elevator Company of Canada, Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Louis A. David, C. J. E. Charbonneau, and others, to manufacture hoisting apparatus.

The Hilton Electric Company, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by Wallace R. Hilton, A. Issenman, and others, to manufacture machinery, tools, instruments, etc.

The Eureka Fence Brace Company, Ltd., Essex, Ont., has been incorporated with a capital stock of $20,000 by William Church, Hugh F. Wigle, and others, of Essex, to manufacture patent fence braces, steel and iron fence posts, etc.

The Aird Island Logging & Trading Company, Ltd., Spanish Mills, Ont., has been incorporated with a capital

stock of $10,000 by Robert McKay, David I. Grant, and others, of Toronto, to erect and operate sawmills.

The Canadian Kennedy Mfg. & Engineering Company, Ltd., Niagara Falls, Ont., has been incorporated with a capital stock of $40,000 by Charles Murphy, Harold Fisher, and others, Ottawa, Ont., to manufacture rock and ore crushers, cement making machinery, etc.

The Hamilton Molybdenum Alloys Company, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $500,000 by William A. Sweet, James Harris, and others, of Hamilton, to treat ore.

The Windsor Milling Company, Ltd., Windsor, Ont., has been incorporated with a capital stock of $100,000 by F. H. Laing, W. A. Cooper, and others, to manufacture flour, etc.

The Excelsior Plate Glass Company, Ltd., Toronto, Ont., has been incorporated with a capital stock of $50,000 by John I. Grover, W. C. Davidson, and others, of Toronto, to manufacture glass and glassware.

The Anchor Cap & Closure Corporation of Canada, Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Hugh H. Donald, William A. McCarthy, and others, of Toronto, to manufacture machinery for the closing of receptacles.

The Canadian Copper & Armor Plate Company, Ltd., Toronto, has been incorporated with a capital stock of $1,000,000 by James F. Uffen, John H. McDonald, and others.

Western Canada

WINNIPEG, MAN., January 16, 1914.

Machinery houses report the volume of business comparatively small, but the outlook a little better. Leading local men are confident that the financial situation will soon clear up enough to allow more progress on new plants, some of which have been under contemplation since last year. As reported previously, most of the business being done now is in machinery parts for repairs, and no very important extensions or additions are being made.

The City Council of Fort Coquitlam, B. C., has approved of the plans for flour mill and grain elevators to be built in that city by the Smith-Davidson Flour Mill & Elevator Company, and it is understood active operations will begin in the immediate future.

The Johnson Sawmill Company, New Westminster, B. C., will make extensions and improvements to its plant at Burnaby Lake. A shingle mill will also be built.

The D. Morton Company, Ltd., Victoria, B. C., has been incorporated to engage in lumbering.

The Federal Cedar Mill Company, Ltd., has been incorporated with headquarters in Vancouver, B. C., to engage in sawmill operation.

About $100,000 is being spent on improvements to the pulp mill of the Dryden Timber & Trading Company, Ltd., Dryden, Western Ontario. Considerable new machinery will be added.

V. C. Morrison, Franklin, Ind., will erect a tile factory at Vernon, B. C.

Foley, Welch & Stewart, Vancouver, B. C., will erect a saw mill 14 miles north of Newport.

The Morrison Steel & Wire Company, Vancouver, B. C., has purchased 16 acres on Lulu Island and will erect a factory.

The ratepayers of Rothern, Sask., passed a by-law to expend $15,000 for an electric light plant.

The ratepayers of Humboldt, Sask., passed by-laws to grant $103,547 for waterworks and $20,500 for an electric light plant.

The new fish packing and cold storage plant to be erected at Steveston, Lulu Island, B. C., for the British Columbia Packers' Association, New Westminster, B. C., will be housed in a heavy mill construction building, resting on concrete and pile foundations. Plans were prepared by the Linde Refrigerating Company, Vancouver, and the contract was awarded to the British Columbia Granitoid Company, Vancouver. The capacity of the cold storage department will be about 5,000,000 lb. The cost of construction will be $200,000.

The British Columbia Milk Condensing Company, Fraser Valley, B. C., has completed arrangements for the erection of a new condensing factory, 80 x 150 ft., in the Delta district, construction of which is to commence immediately. It is hoped to have it ready for operation in April.

It is announced that the Merryweather Company, London, England, will erect a factory in Calgary, Alberta, to manufacture fire apparatus. The factory will cost $250,000.

The Grain Growers' Association will erect a grain elevator at Kamloops, B. C., to cost $40,000. The proposed building will be 100 x 160 ft. The machinery will be driven by electricity, the motors to develop about 75 hp. C. W. St. Clair will be manager of the elevator.

The Winnipeg Ceiling & Roofing Company and the Edmonton Metals, Ltd., Edmonton, Alberta, will start at once on the erection of a plant on Agnes street and Willow avenue. M. J. McMartin is president of the company.

Government Purchases

WASHINGTON, D. C., January 15, 1914.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, under schedule 6283, until February 10, for a motor-driven tumbling barrel, for a motor-driven core-wire straightening machine and for a motor-driven core cutting-off and coning machine for Portsmouth; schedule 6295 for an oxygen compressor for Brooklyn; schedule 6294 for a duplex horizontal pump for Lake Denmark, N. J.

Bids will be received at the office of the general purchasing officer, Isthmian Canal Commission, Washington, D. C., until February 3, under circular 822 for motor-driven air compressors.

Bids will be received until January 27 by the paymaster-general of the navy for furnishing the following:

Schedule 6202—Steam Engineering

Class 64, Puget Sound—One simplex vertical pump.
Class 64, Alternate—F.o.b. works.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, January 13 for supplies for the navy yards as follows:

Schedule 6156—Yards and Docks

Class 82, Portsmouth—One Gantry crane for naval magazine—Exeter Machine Works, $2200; Hoisting Machinery Company, $4500; Niles-Bement-Pond Company, $3965.

Schedule 6157—Steam Engineering

Class 91, Portsmouth—Two pressure blowers, motor driven—DeLaval Steam Turbine Company, $2300; Manning, Maxwell & Moore, $1460 and $1520; National Electrical Supply Company, $1694; P. H. & F. M. Roots Company, $1351.50, $1337.50 and $938.50; 231, B. F. Sturtevant Company, $2445; General Electric Company, $1230.

Schedule 6177—Steam Engineering

Class 231, Philadelphia—Seven steam traps—Bid Brogan & Co., $208.25; G. M. Davis Regulator Company, $87; Ford & Kendig Company, $286.50; Lytton Mfg. Corporation, $300; George M. Newhall Engineering Company, $170.80; Schutte & Koerting, $415; James D. Rawles Company, $244.30.

Class 232, Brooklyn—Eight vertical simplex feed pumps—Bid 30, Blake & Knowles Steam Pump Works, $143; M. I. Davidson & Co., $77.

Schedule 6105—Construction and Repair

Class 24, Puget Sound—One 600-lb. single-frame steam hammer—Manning, Maxwell & Moore, $1050; Niles-Bement-Pond Company, $948; D. Nast Machinery Company, $1080 and $1135; Ward & Co., $1090.

Class 24, Alternate—F.o.b. works—Morgan Engineering Company, $1050; Manning, Maxwell & Moore, $775; Niles-Bement-Pond Company, $681; D. Nash Machinery Company, $735; Ward & Co., $695; William A. Wood, $779.

Schedule 6126—Ordinance

Class 51, Washington—One horizontal boring and milling machine—Niles-Bement-Pond Company, $18,600.

Union Machine Company, $198; San Francisco, 14 days; Llewellyn Iron Works, $270; Los Angeles, Cal., 10 days; Baker Iron Works, $275; Los Angeles, 6 days; Advance Machine Company, $330; Los Angeles, Cal., 30 days; Byron-Jackson Iron Works, $345; 2 per cent, 10 days; West Berkeley, Cal., 20 days.

Bids were received January 8 by the general purchasing officer, Isthmian Canal Commission, Washington, D. C., for furnishing one pipe-cutting machine, under Z. R. 7156-A:

F. S. Banks & Co., $251; the Fairbanks Company, $256 and $349; Kemp Machinery Company, $263.20; Knox & Bro., $259.50; Manning, Maxwell & Moore, $227; Manufacturers' Agency & Sales Company, $246.90; Manhattan Supply Company, $292; Niles-Bement-Pond Company, New York City, $875; H. A. Rogers, $266; Ward & Co., $428.35.

The Steel Corporation Suit

(Continued from page 287)

On cross-examination he gave interesting testimony regarding fluctuations in sheet prices.

E. A. Peden, Peden Iron & Steel Company, Houston, Tex., on being questioned as to why he had suddenly given his business to the corporation after having for a long time, particularly for the six months previous to the change, dealt very largely with the Colorado Fuel & Iron Company, said that the change was due to an increase of freight rates and a decrease of water rates, which had put the Colorado Company out of the running. He did not know whether the freight rates were changed at the wish of the corporation or not.

J. B. Simmons, president Woodward-Wight Company, New Orleans, told approximately how much of the various steel and iron products under consideration his company buys annually and what proportion of that goes to the corporation and how much the independents get. On the whole he seemed to think that the independents got the best of it, so far as his company is concerned. He said on cross-examination that though the corporation's price fluctuated less than the prices of the independents, he found it to his advantage to buy from the steady-priced corporation, even when the independent price was lower.

On Thursday, January 15, Paul H. Laroussini, president A. J. Nelson Mfg. Company, New Orleans, said his company bought about 1500 tons of sheet steel annually, of which 30 per cent. was purchased from the corporation. He said he had been actively engaged in buying since 1908. In that time, he added, numerous firms had bid for his business and competition was particularly active. He knew of no pressure exerted by the corporation in restraint of trade or to kill off independents. His testimony concluded the proceedings at New Orleans.

HEARING AT ST. LOUIS

The next place at which evidence was taken was St. Louis, where the hearing began on Monday, January 19. The first witness was Archibald McGregor, McGregor-Noe Hardware Company, Springfield, Mo., who testified that of 2000 tons of various steel goods which he bought last year 90 per cent. came from the American Steel & Wire Company. That company, he said, at times reduced its prices to meet competition, but he said he dealt with it not because of its price quotations but because of the quality of its goods.

Thomas J. Frier, purchasing agent of the Wabash Railroad, said that he bought rails and other supplies on competitive quotations. Quotations varied, he said, and the firm making the lowest bid got the business.

The United States court at Milwaukee has confirmed the sale of the tangible assets of the Beaver Dam Malleable Iron Company, Beaver Dam, Wis., bankrupt, to Jesse C. Bradley, representing Lawrence Fitch, vice-president of the defunct concern, for $12,750. Mr. Fitch has issued a circular to creditors in which he proposes a plan of reorganization, open to any creditor who desires to pay a proportionate part of $16,000 which he has invested in the assets. The property was bought subject to a mortgage of $160,000. Mr. Fitch further proposes that creditors subscribe in a like proportion to $240,000 stock in a new corporation, which is to have a capital stock of $400,000, the difference representing the mortgage.

Plans for the Foundrymen's Conventions

The joint committee of the Allied Foundrymen's Associations, of which A. E. Howell, Nashville, Tenn., is chairman, and R. A. Bull, Granite City, Ill., secretary, met at the Hotel La Salle, Chicago, Saturday, January 17. The committee is made up of the executive boards of the American Foundrymen's Association and the Foundry & Machine Exhibition Company and the officers of the American Institute of Metals and the Associated Foundry Foremen. There was a full attendance. In the morning separate metings were held by the representatives of each organization. At noon a luncheon was given by the committee representing Chicago foundry interests, and in an informal manner and with impromptu exchange of courtesies the way was paved for the co-operative preparation of plans for the convention to be held September 7 to 12, inclusive.

In the afternoon the joint committee, meeting with the local representatives, discussed the prospects and plans for the convention. Several of those present referred to the desirability of having less entertainment of a definitely arranged character at the time of the convention and of giving more serious attention to the educational objects of the associations. The meeting recognized the necessity for securing for the professional sessions papers, perhaps fewer in number, but selected with increasing emphasis on quality. To this end a policy was formulated, in accordance with which the ordinary expenses incident to the reading of a paper and attendance in a distant city will not have to be borne by those from whom such papers are sought. As a foundation for the fund to meet such expenses the Foundry & Machine Exhibition Company contributed $750.

Formal action was taken by the joint committee, as representing the voice of each association to the effect that it was the plan and wish that the 1915 convention of the Allied Foundry Associations and the exhibit of the Foundry & Machine Exhibition Company be held in the East and at a time and place that would contribute as far as possible to the success of the International Foundry Congress. Plans for the 1914 convention programme were tentatively discussed.

Trade Publications

Hydraulic Presses.—Watson-Stillman Company, 190 Fulton street, New York City. Catalogue No. 89. Relates to an extensive line of hydraulic presses for chilling, heating and die work. The various types are illustrated with both line and halftone engravings, the illustration being located either on the same page with the description or on the facing one. The descriptions are concise yet comprehensive and bring out the principal features about each press and the uses to which it is to be put. Condensed specification tables are included in practically every case. In addition to the presses, a complete hydraulic die press outfit and a self-contained motor-driven die press are illustrated, and there are a number of line drawings showing arrangements of hydraulic presses with hand and belt-driven pumps and the company's accumulator system. Other products such as hydraulic forging presses, pumps, bending and punching machines and jacks and lever punching and shearing machines are also mentioned.

Bearing Metals and Valve Disks.—A. Allan & Son, 486 Greenwich street, New York City. Folder and card. The first relates to the saving in maintenance cost of rolling mill roll bearings that can be effected by this company's bronze bearings. An engraving of a train of rolls upon which this metal has been used is given, together with a reproduction of the trademark. The card calls attention to the use of a special composition metal valve disk as a substitute for vulcanized ones. A view of one of these disks is given, together with a list of the sizes in which they are made.

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